Service Manual

ORDER NO.
CRT2276

7 INCH WIDE AV SYSTEM DISPLAY /CD PLAYER

AVX-P7000CD UC,EW,ES

7 INCH WIDE AV SYSTEM DISPLAY

AVX-7000 UC,EW,ES

● This service manual should be used together with the following manual(s):

Model	Order No.	Mech. Module	Remarks
AVX-P7000CD/UC,EW,ES	CRT2379	———	———
AVX-7000/UC,EW,ES	CRT2380	———	———

● This manual contains the information on the LCD module and the Drive mechanism unit used in the AVX-P7000CD and AVX-7000. For the other information, refer to the main manuals listed above.

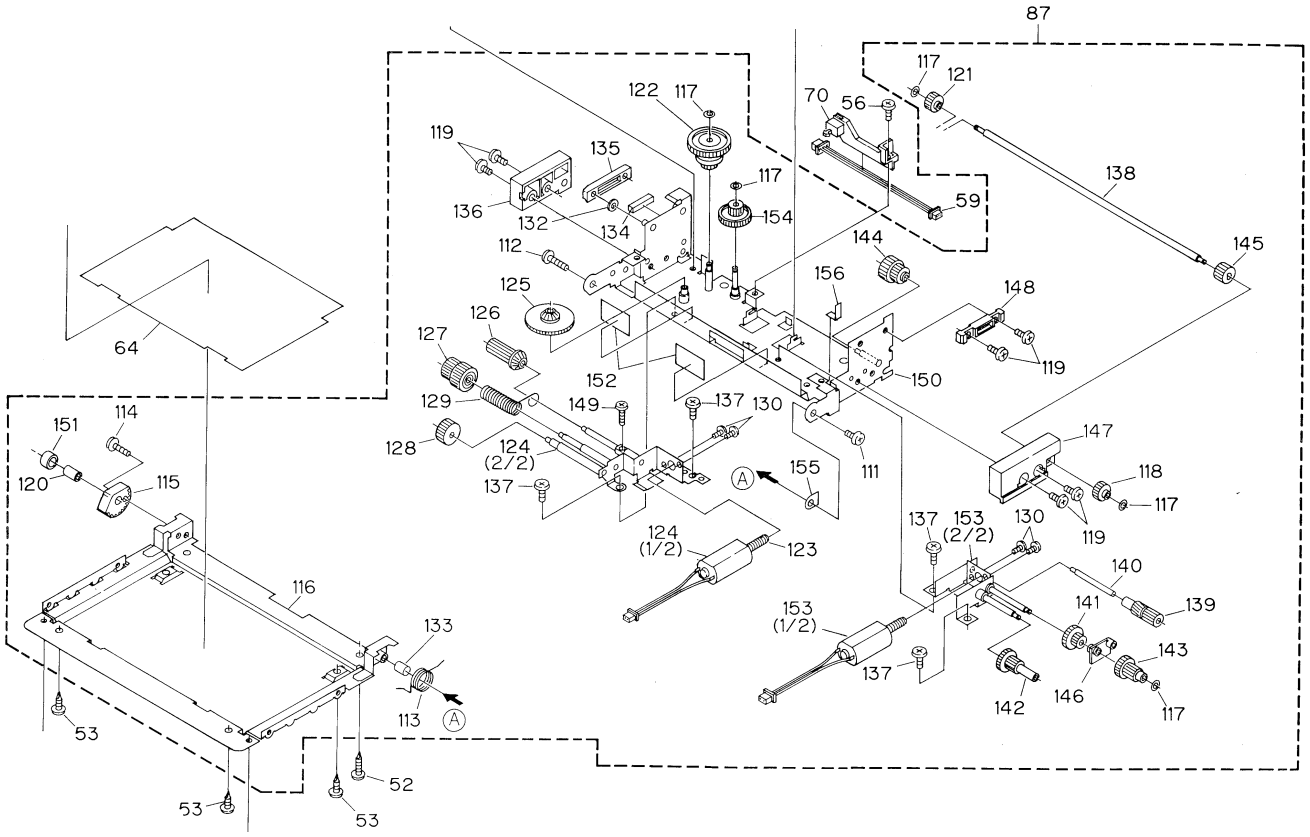
CONTENTS

PIONEER CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS SERVICE INC. P.O.Box 1760, Long Beach, CA 90801-1760 U.S.A.
PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE.LTD. 253 Alexandra Road, #04-01, Singapore 159936

K-ZZU. JULY 1999 Printed in Japan

1. EXPLODED VIEWS AND PARTS LIST

1.1 DRIVE MECHANISM UNIT

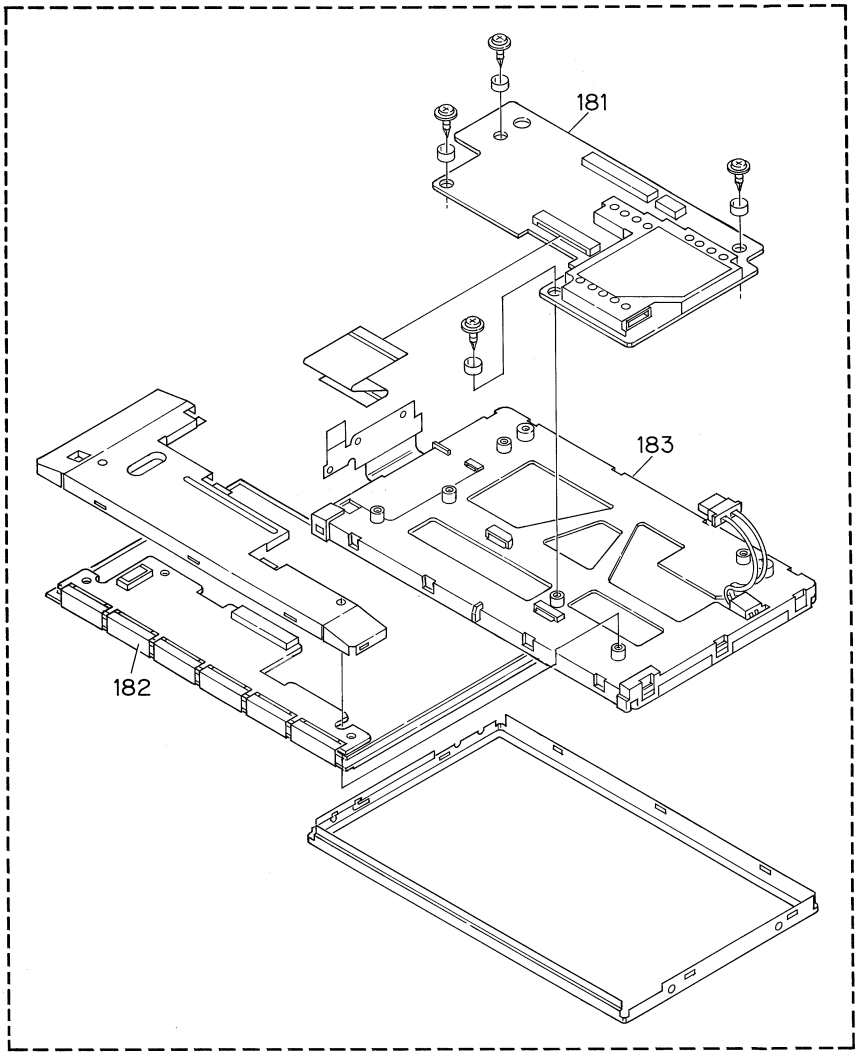


● DRIVE MECHANISM UNIT SECTION PARTS LIST

Mark No.	Description	Part No.
111	ScrewM2X3	FB1521
112	ScrewM2X9	FB1523
113	Spring	FS1573
114	ScrewM2X5.5	FB1522
115	Gear	FH1267
116	Cover Unit(UC,EW model)	FK1850
	Cover Unit(ES model)	FK1887
117	Washer	FX1055
118	Gear	374K
119	ScrewM2.6X3.5	FB1520
120	Collar	FH1268
121	Gear	374M
122	Torque Limiter	376F
123	Gear	376J
124	Motor Assy	CXX1398
125	Gear	376T
126	Gear	376U
127	Gear	376V
128	Gear	FH1266
129	Spring	FS1574
130	ScrewM2X3	FB1031
132	Collar	FX2631
133	Pipe	FX2619
134	Cushion	FX2483
135	Guide	377A

MarkNo.	Description	Part No.
136	Guide	376Y
137	ScrewM2.6X2.5	FB1519
138	Shaft	FD1233
139	Worm Wheel	373V
140	Gear Shaft	FD1232
141	Gear	373W
142	Gear	374F
143	Gear	374G
144	Gear	374H
145	Gear	374J
146	Toe Gear	376W
147	Guide	376Z
148	Guide	376X
149	ScrewM1.7X6	FB1524
150	Try Assy	FK1847
151	Spacer	HF1282
152	Sheet	FX2482
153	Motor Assy	CXX1399
154	Worm Wheel	373T
155	Nonwoven Fabric	FX2618
156	Sheet	FX2594

1.2 LCD MODULE

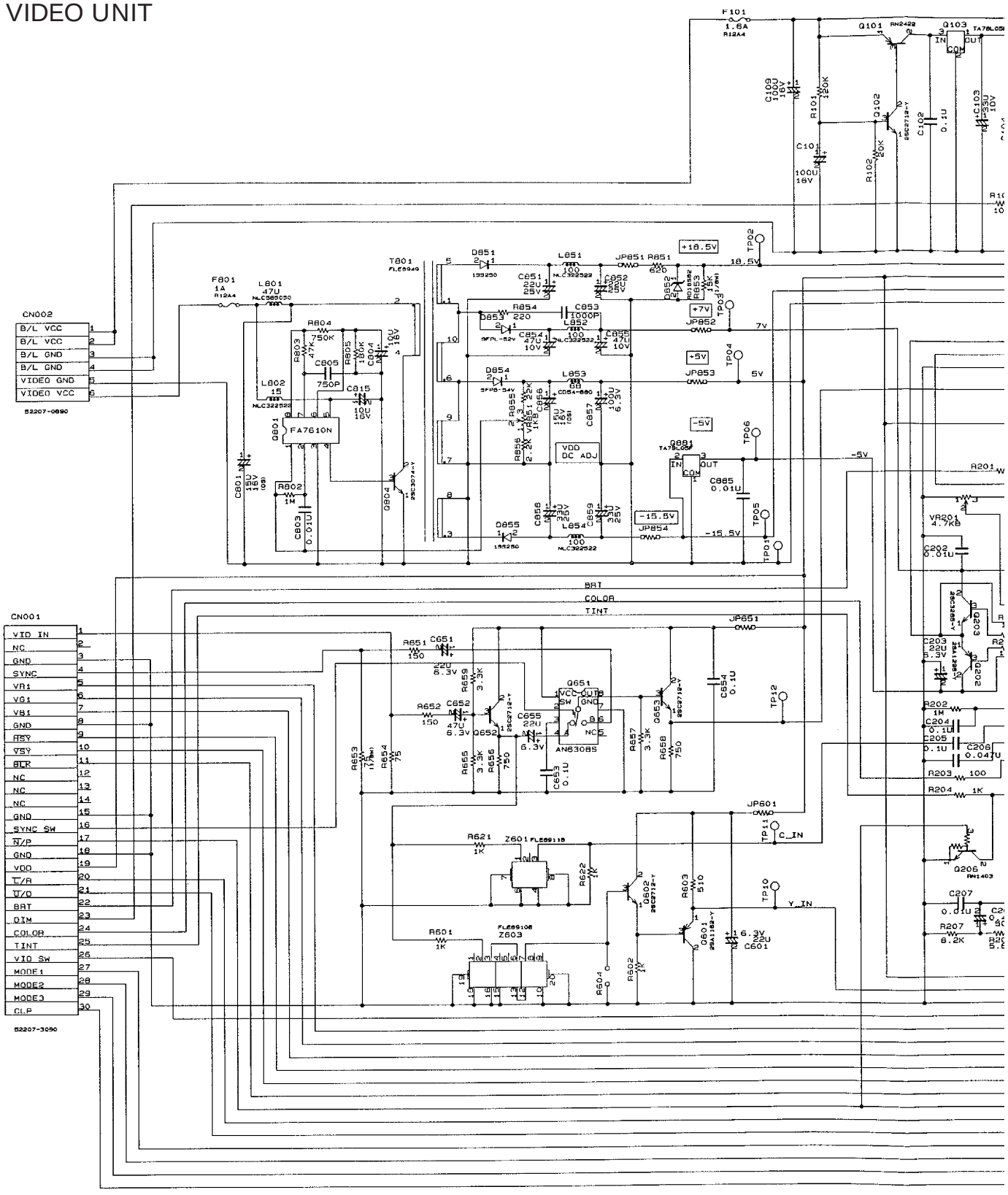


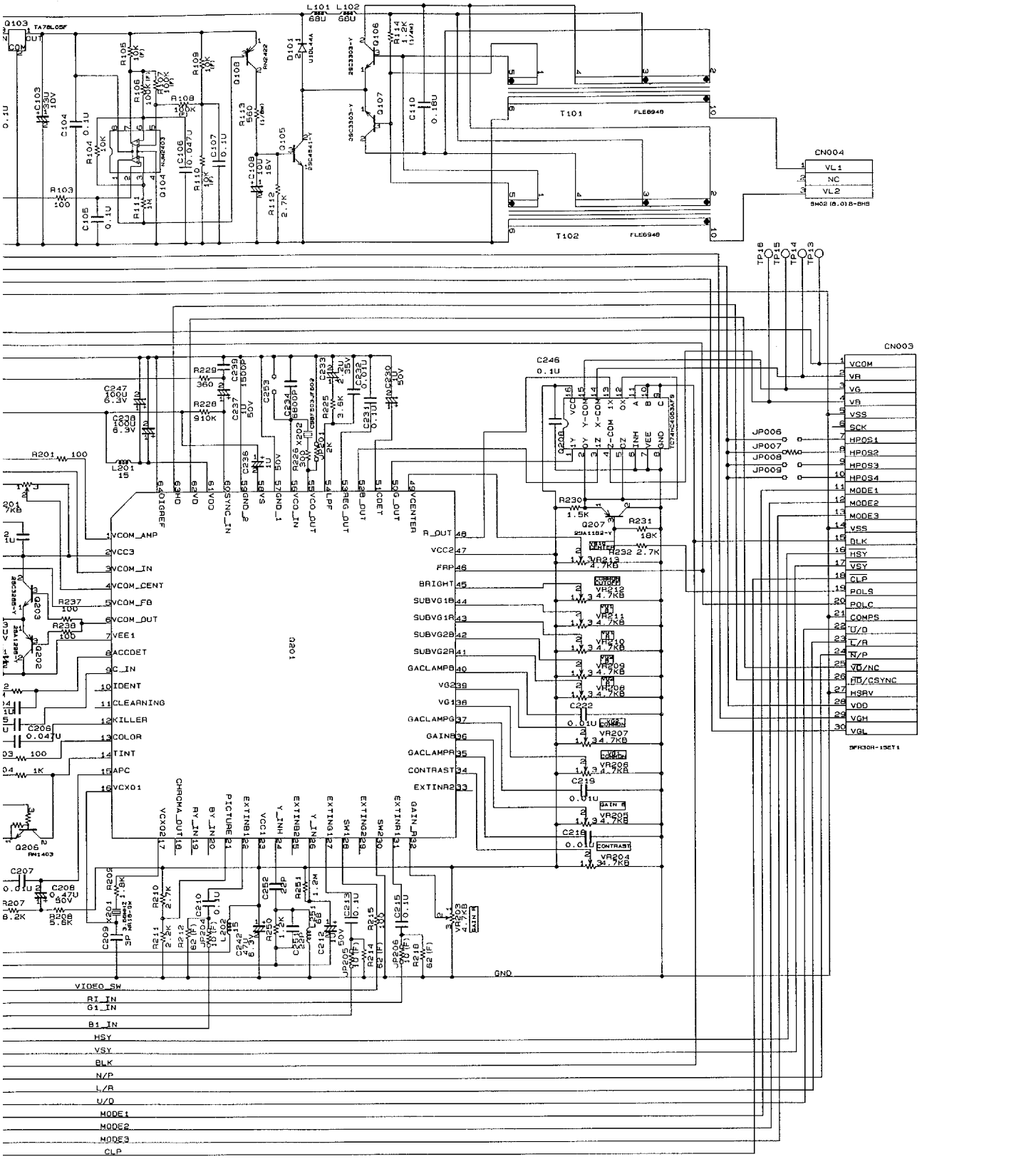
● LCD MODULE SECTION PARTS LIST

Mark	No.	Description	Part No.
	181	Video Unit	NMP70-8398-112
	182	TFT-LCD Module	TFD70W14A
	183	B/L Unit	NMP75-8376-211

2. SCHEMATIC DIAGRAM

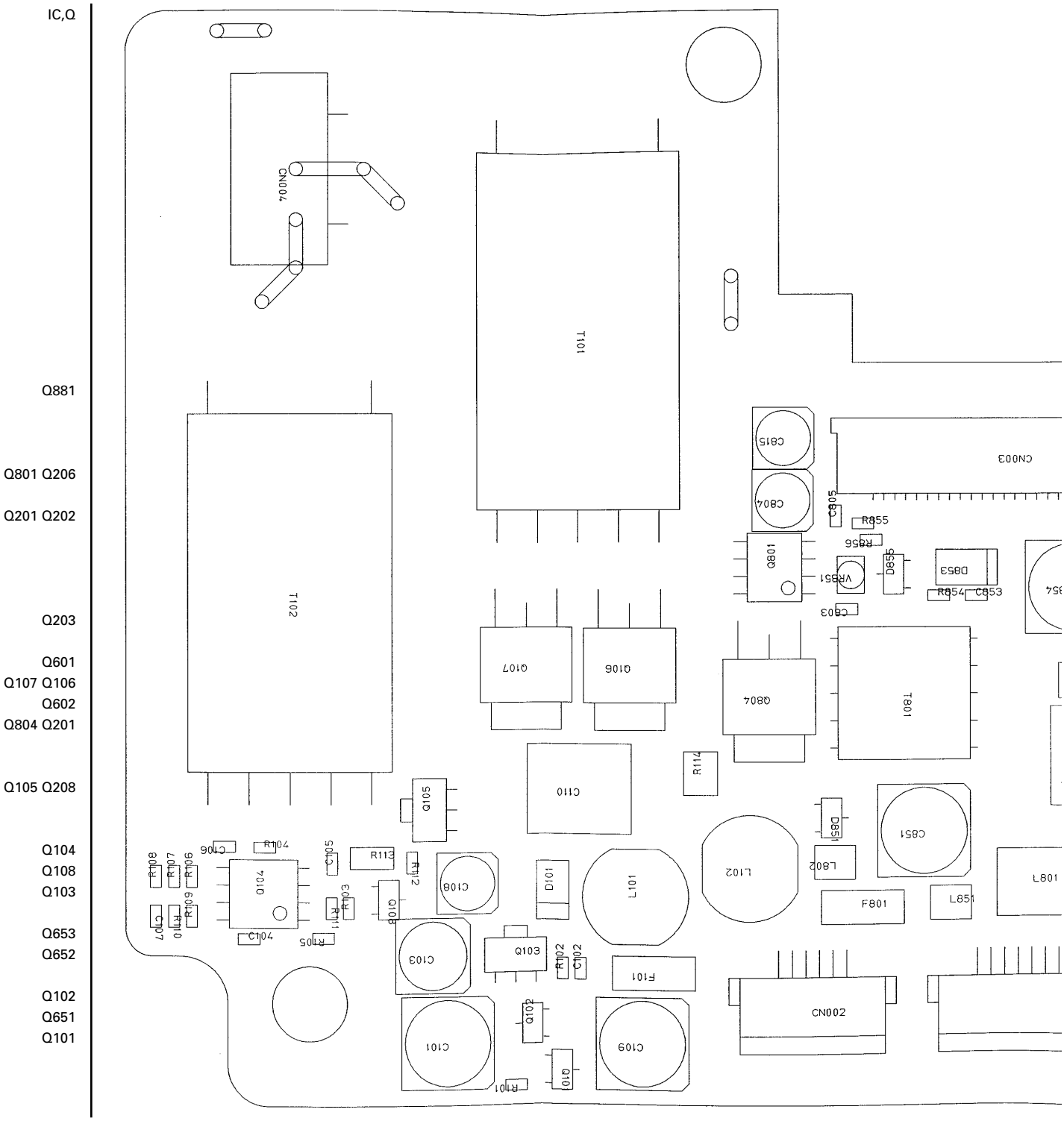
2.1 VIDEO UNIT




CN004
VL1
NC
VL2
CN003
VCOM
VR
VG
VB
VSS
SCK
HPOS1
HPOS2
HPOS3
HPOS4
MODE1
MODE2
MODE3
VSS
BLK
HSY
VSY
CLP
POLS
POLC
COMPS
U/D
L/R
N/P
VD/NC
HD/CSYNC
HSRV
VDD
VGH
VGL
JP006
JP007
JP008
JP009
TP18
TP15
TP14
TP13
T101
T102
VIDEO_SW
R_IN
G_IN
B_IN
HSY
VSY
BLK
N/P
L/R
U/D
MODE1
MODE2
MODE3
CLP
GND

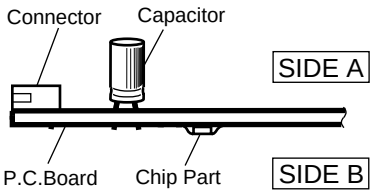
3. PCB CONNECTION DIAGRAM

3.1 VIDEO UNIT

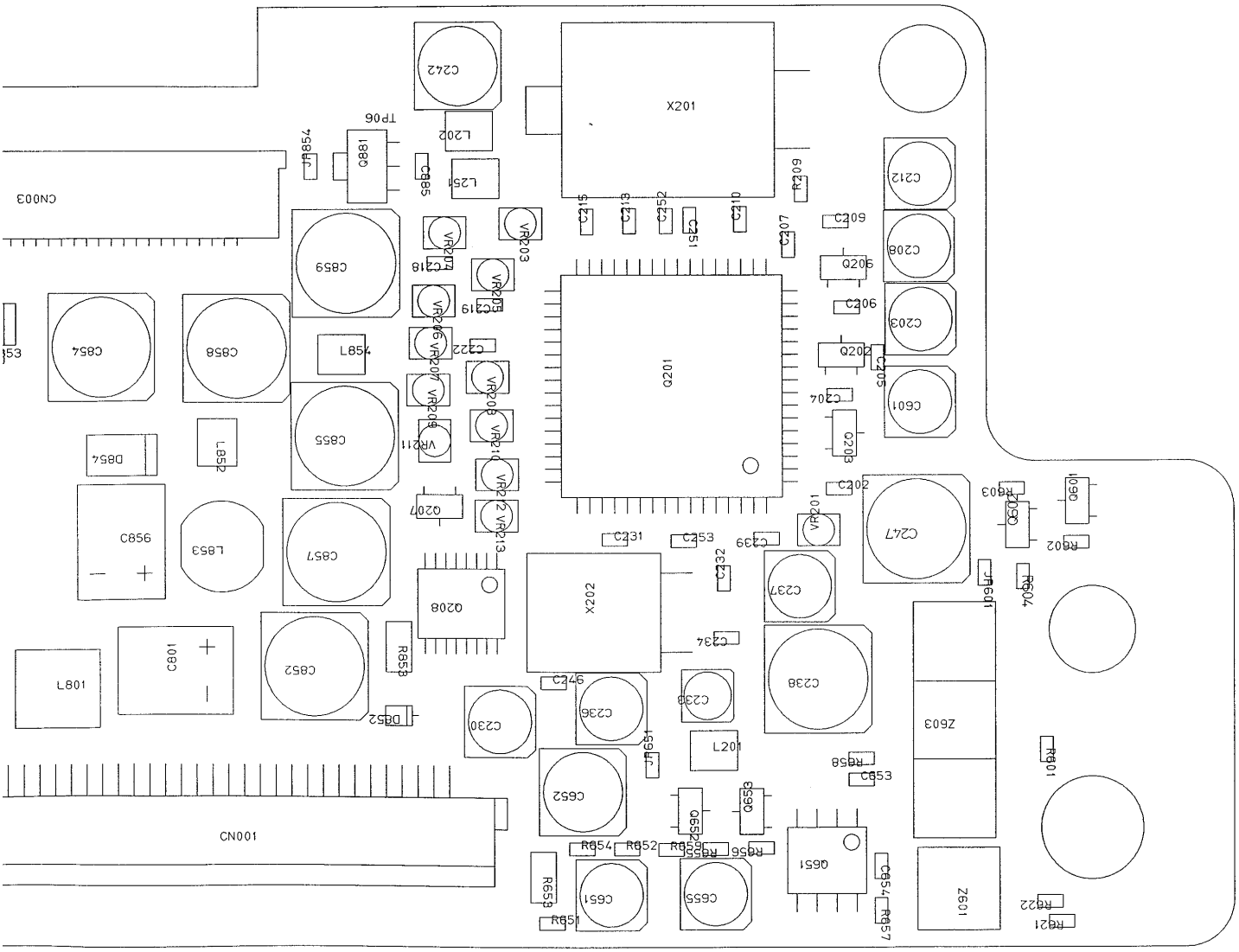


NOTE FOR PCB DIAGRAMS

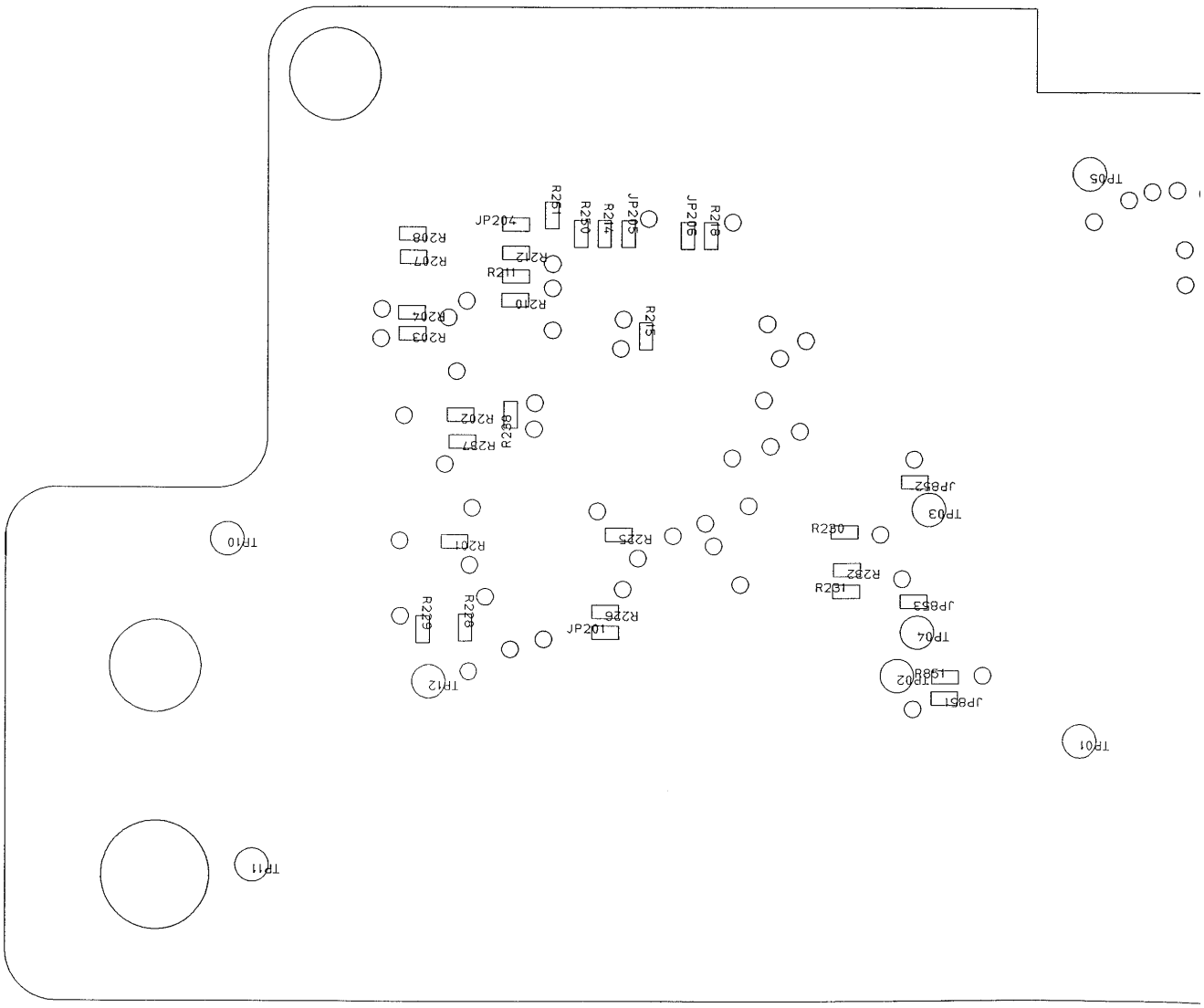
1. The parts mounted on this PCB include all necessary parts for several destination.
   For further information for respective destinations, be sure to check with the schematic diagram.
2. Viewpoint of PCB diagrams



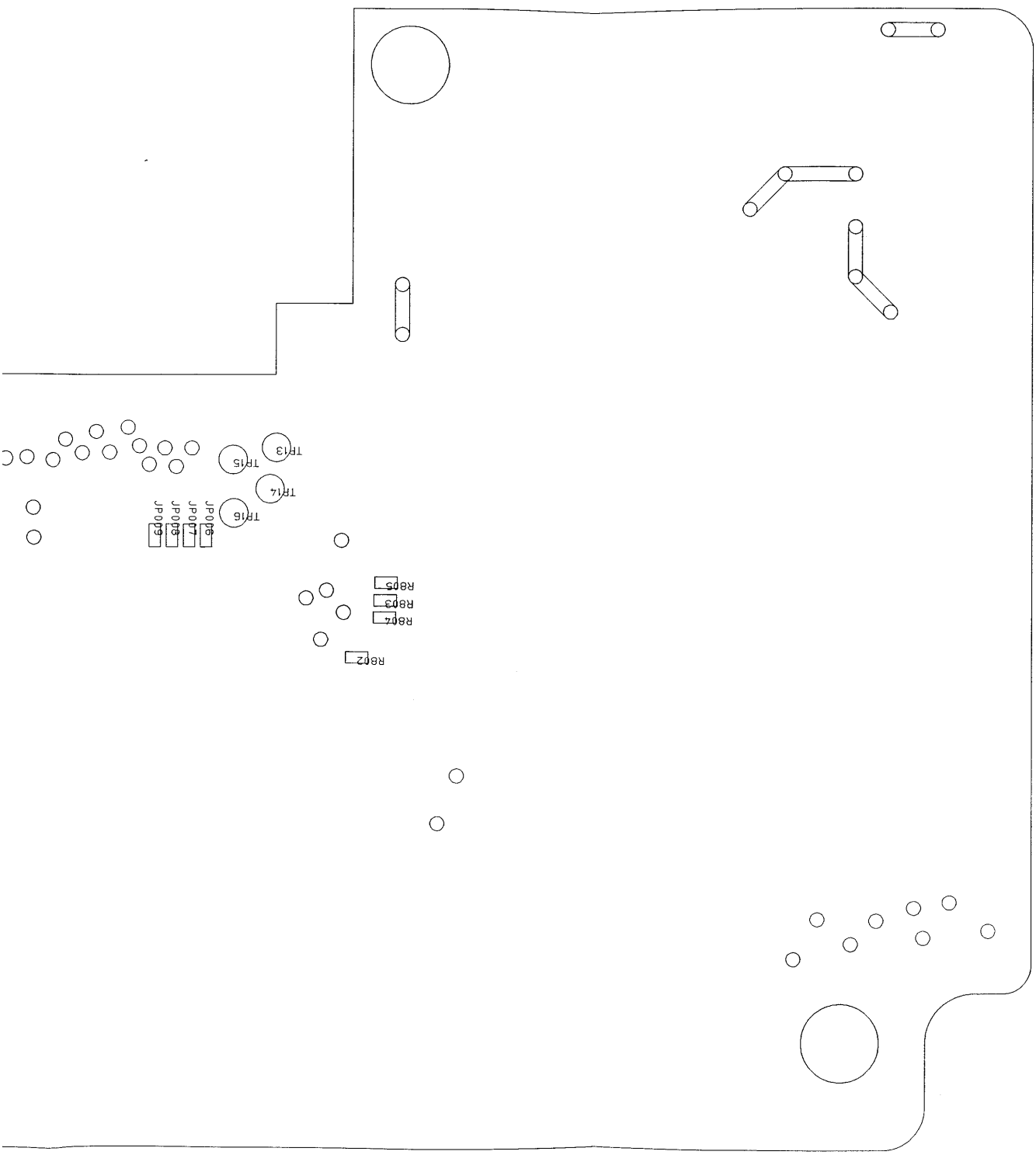
SIDE A



SIDE B


TP05
JP204
R251
R250
R214
JP205
JP206
R216
R208
R207
R212
R211
R210
R204
R203
R215
R202
R287
R288
JP852
TP03
TP10
R201
R225
R280
R282
R281
JP853
R223
R224
R226
JP201
TP04
TP12
R983
TP02
JP851
TP01
TP11

SIDE B


TR13
TR15
TR14
TR16
JP009
JP010
JP007
JP006
R805
R803
R804
R802

5. ELECTRICAL PARTS LIST

NOTE:

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

Chip Resistor

RS1/◯S◯◯◯J,RS1/◯◯S◯◯◯J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

Unit Number :
Unit Name : Video Unit

MISCELLANEOUS

Circuit Symbol and No.	Part Name	Part No.
Q 101		RN2422
Q 102		2SC2712-Y
Q 103		TA78L05F
Q 104		NJM2403M
Q 105		2SC4541-Y
Q 106		2SC3303-Y
Q 107		2SC3303-Y
Q 108		RN2422
Q 201		NJW1300A
Q 202		2SA1298-Y
Q 203		2SC3265-Y
Q 206		RN1403
Q 207		2SA1162-Y
Q 208		TC74HC4053AFS
Q 601		2SA1162-Y
Q 602		2SC2712-Y
Q 651		AN6308S
Q 652		2SC2712-Y
Q 653		2SC2712-Y
Q 801		FA7610N
Q 804		2SC3074-Y
Q 881		TA79L05F
D 101		
D 851		
D 852		
D 853		
D 854		
D 855		1SS250
F 101		
F 801		CEK1173
L 101		
L 102		
L 201		LCTA150J3225
L 202		LCTA150J3225
L 251		
L 801		
L 802		LCTA150J3225
L 851		LCTA101J3225
L 852		LCTA101J3225
L 853		
L 854		LCTA101J3225
T 101		FLE6948
T 102		FLE6948
T 801		FLE6949
VR 201		
VR 203		
VR 204		
VR 205		
VR 206		
VR 207		
VR 208		
VR 209		
VR 210		
VR 211		
VR 212		
VR 213		
VR 851		
X 201		NR18-GW3.58
X 202		CSBF503JF502
Z 601		FLE6911B
Z 603		FLE6910B
JP 006		RS1/16S0R0J
JP 007		RS1/16S0R0J
JP 008		RS1/16S0R0J
JP 009		RS1/16S0R0J
JP 201		RS1/16S202J
JP 204		RS1/16S10R0F
JP 205		RS1/16S10R0F
JP 206		RS1/16S10R0F
JP 601		RS1/16S0R0J
JP 602		RS1/16S0R0J
JP 651		RS1/16S0R0J
JP 851		RS1/16S0R0J
JP 852		RS1/16S0R0J
JP 853		RS1/16S0R0J
JP 854		RS1/16S0R0J
CN 001		
CN 002		
CN 003		
CN 004		

RESISTORS

Circuit Symbol and No.	Part Name	Part No.
R 101		RS1/16S124J
R 102		RS1/16S203J
R 103		RS1/16S101J
R 104		RS1/16S103J
R 105		RS1/16S1002F
R 106		RS1/16S1003F
R 107		RS1/16S1003F
R 108		RS1/16S1003F
R 109		RS1/16S1002F
R 110		RS1/16S1002F

=====Circuit Symbol and No.		===Part Name	Part No.
R	111		RS1/16S105J
R	112		RS1/16S272J
R	113		RS1/8S561J
R	114		RS1/4S122J
R	201		RS1/16S101J
R	202		RS1/16S105J
R	203		RS1/16S101J
R	204		RS1/16S102J
R	207		RS1/16S822J
R	208		RS1/16S562J
R	209		RS1/16S182J
R	210		RS1/16S272J
R	211		RS1/16S222J
R	212		RS1/16S62R0F
R	214		RS1/16S62R0F
R	215		RS1/16S101J
R	218		RS1/16S62R0F
R	225		RS1/16S472J
R	226		RS1/16S301J
R	228		RS1/16S911J
R	229		RS1/16S361J
R	230		RS1/16S152J
R	231		RS1/16S183J
R	232		RS1/16S272J
R	237		RS1/16S101J
R	238		RS1/16S101J
R	250		RS1/16S122J
R	251		RS1/16S105J
R	601		RS1/16S102J
R	602		RS1/16S102J
R	603		RS1/16S511J
R	604		RS1/16S102J
R	621		RS1/16S102J
R	622		RS1/16S102J
R	651		RS1/16S151J
R	652		RS1/16S151J
R	653		RS1/16S750J
R	654		RS1/16S750J
R	655		RS1/16S332J
R	656		RS1/16S751J
R	657		RS1/16S332J
R	658		RS1/16S751J
R	659		RS1/16S332J
R	802		RS1/16S105J
R	803		RS1/16S473J
R	804		RS1/16S754J
R	805		RS1/16S184J
R	851		RS1/16S621J
R	853		RS1/16S153J
R	854		RS1/16S221J
R	855		RS1/16S223J
R	856		RS1/16S222J

CAPACITORS

C	101	CEHV101M16
C	102	CKSRYF104Z25
C	103	CEHV330M10
C	104	CKSRYF104Z25
C	105	CKSRYF104Z25
C	106	CKSRYB473K16
C	107	CKSRYF104Z25
C	108	CEHV100M16
C	109	CEHV101M16
C	110	
C	202	CKSRYB103K50
C	203	
C	204	CKSRYF104Z25
C	205	CKSRYF104Z25
C	206	CKSRYB473K16
C	207	CKSRYB103K50
C	208	CEHV4R7M50
C	209	CCSRCH030C50
C	210	CKSRYF104Z25
C	212	CEHV1R0M50
C	213	CKSRYF104Z25
C	215	CKSRYF104Z25
C	218	CKSRYB103K50
C	219	CKSRYB103K50
C	222	CKSRYB103K50
C	230	CEHV1R0M50
C	231	CKSRYF104Z25
C	232	CKSRYB103K25
C	233	CEHV2R2M50
C	234	CKSRYB682K50
C	236	CEHV1R0M50
C	237	CEHV1R0M50
C	238	CEHV101M6R3
C	239	CKSRYB152K50
C	242	CEHV470M6R3
C	246	CKSRYF104Z25
C	247	CEHV101M6R3
C	251	CCSRCH220J50
C	252	CCSRCH220J50
C	253	
C	601	CEHV220M6R3
C	651	CEHV220M6R3
C	652	CEHV470M6R3
C	653	CKSRYF104Z25
C	654	CKSRYF104Z25
C	655	CEHV220M6R3
C	801	
C	803	CKSRYB103K50
C	804	
C	805	CCSRCH751J25
C	815	
C	851	
C	852	
C	853	CKSRYB102K50
C	854	
C	855	
C	856	
C	857	
C	858	
C	859	
C	885	CKSRYB103K50

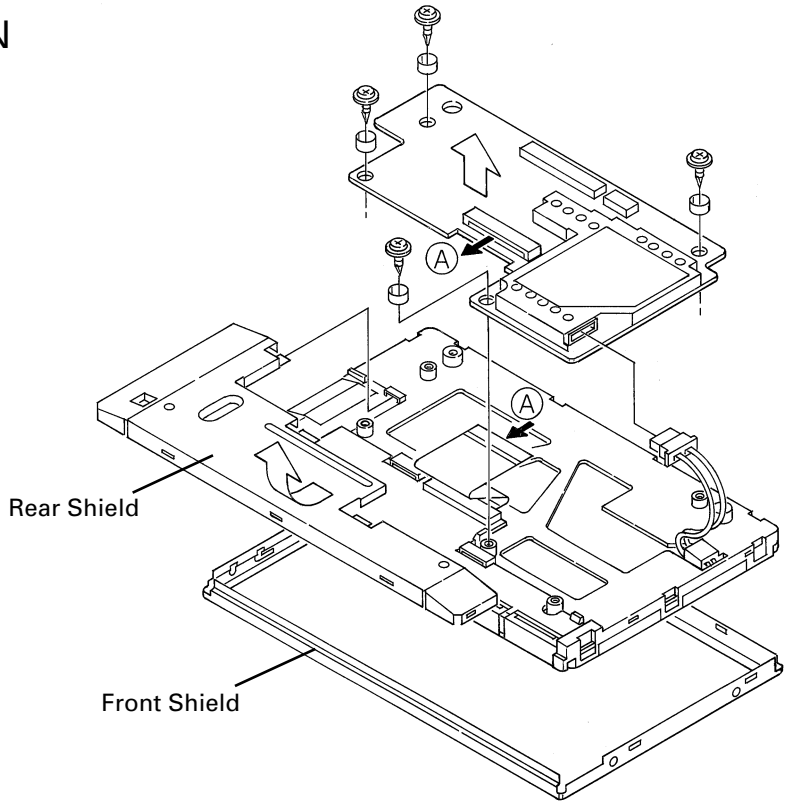
	1st production (TFD70W14-MM1)	Running change (TFD70W14-MM2)
HPOS	JP007: 0Ω Resistor (HPOS2=Hi)	JP008:0Ω Resistor (HPOS3=Hi)

5. GENERAL INFORMATION

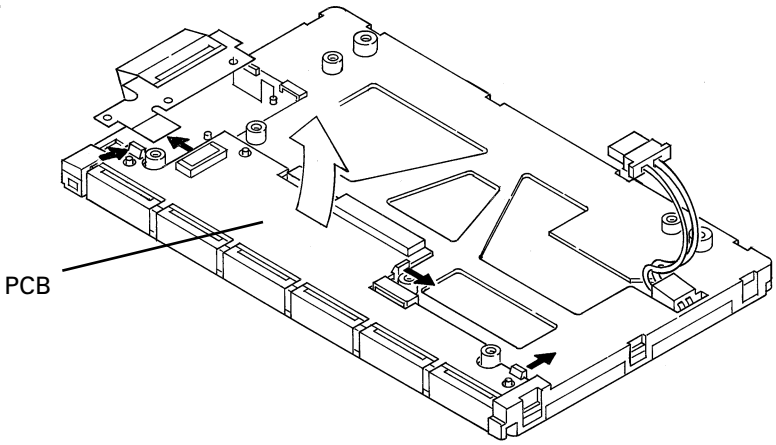
5.1 DISASSEMBLY

● Removing the Back Light Unit

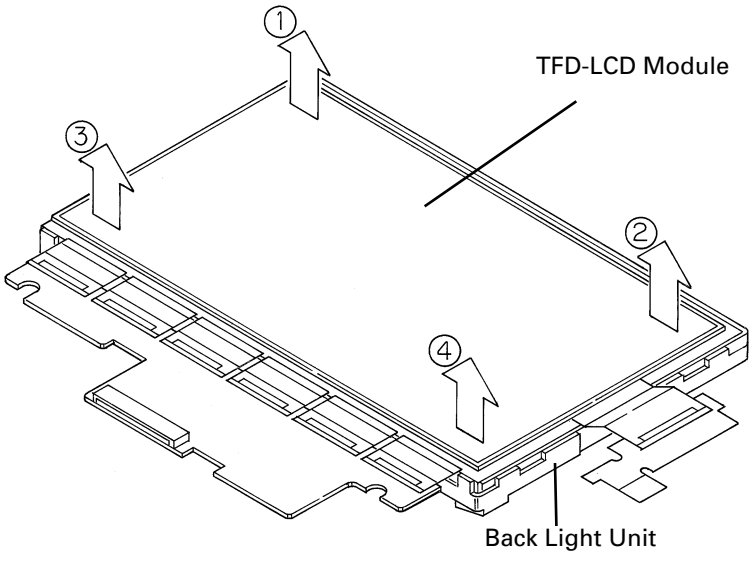
1. Remove the four screws.
2. Disconnect the two connectors.
3. Remove the rear shield and front shield.



4. Disconnect the connector and remove the PCB.

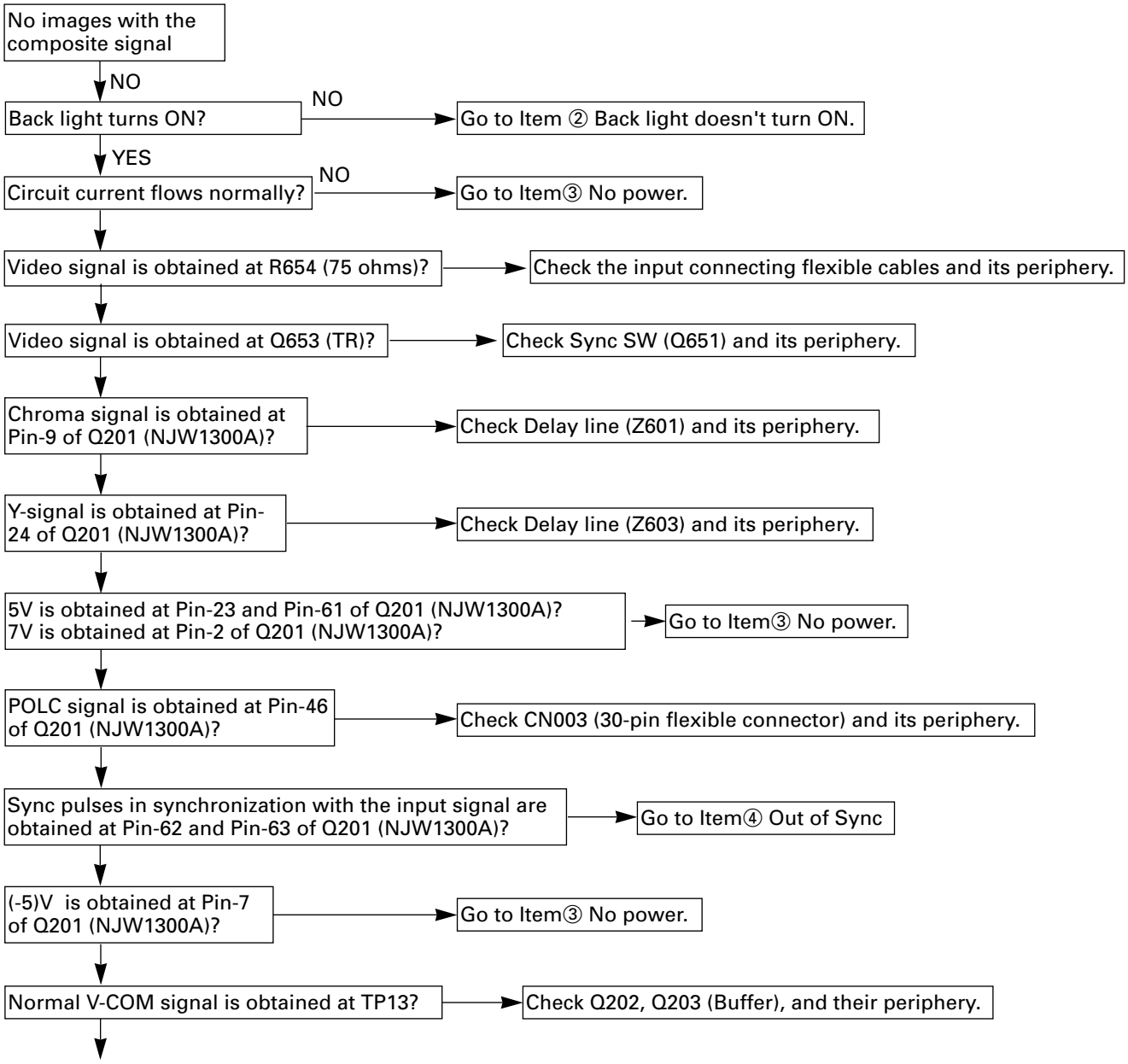


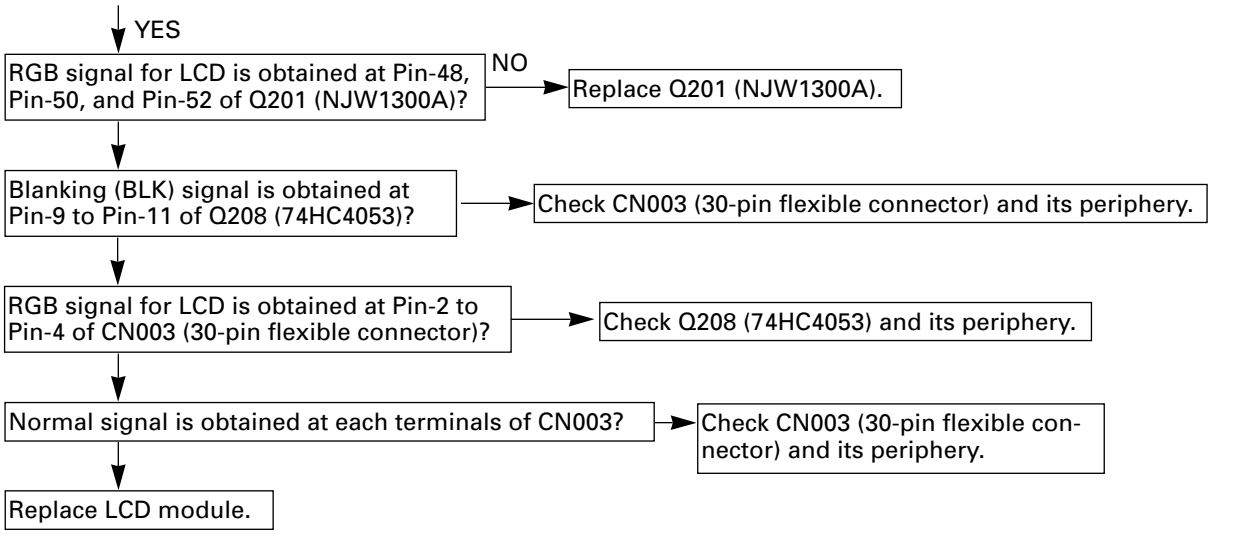
5. Remove the TFD-LCD Module.



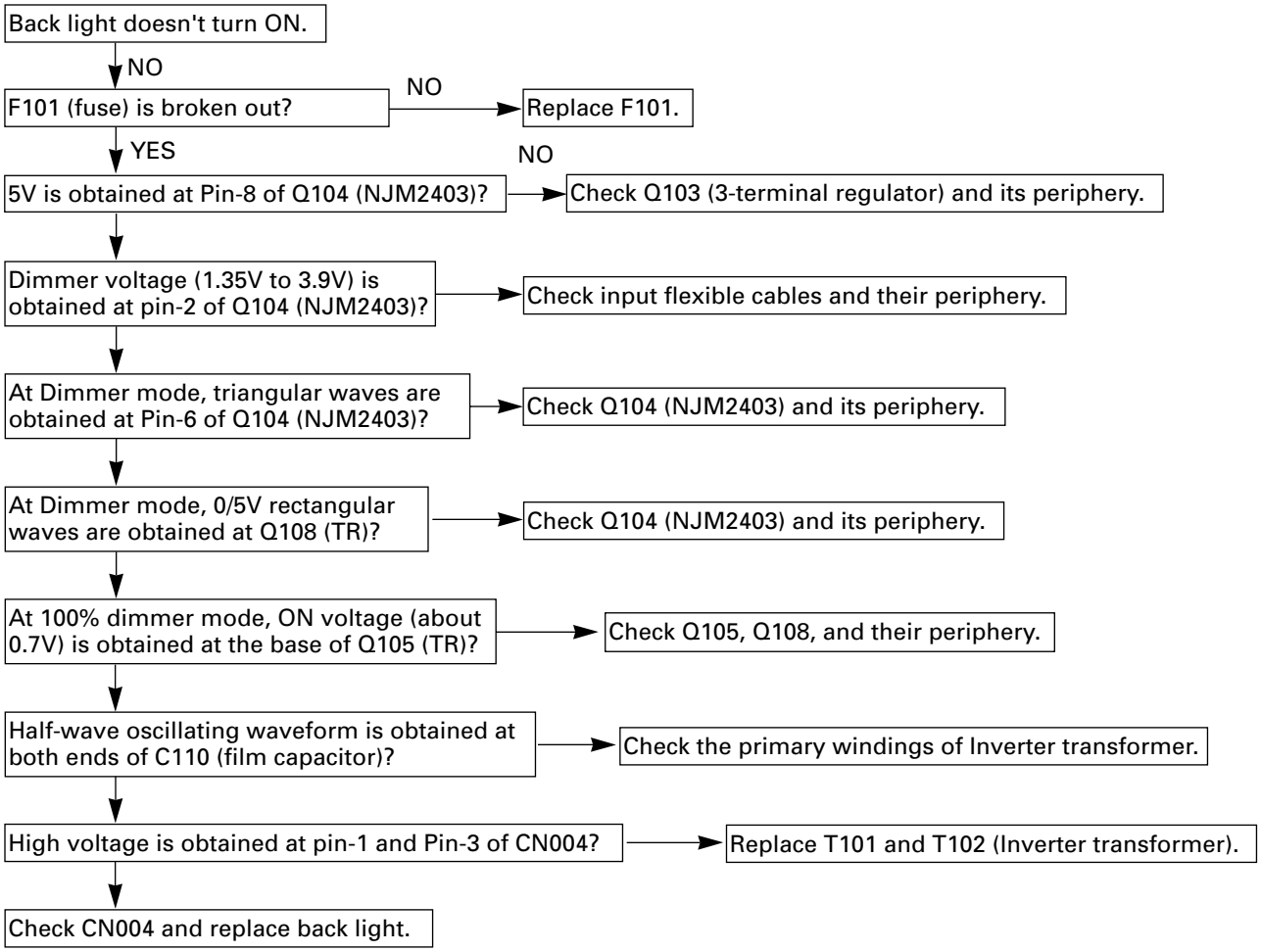
● CWX2389 LCD module troubleshooting

①No images with the composite signal

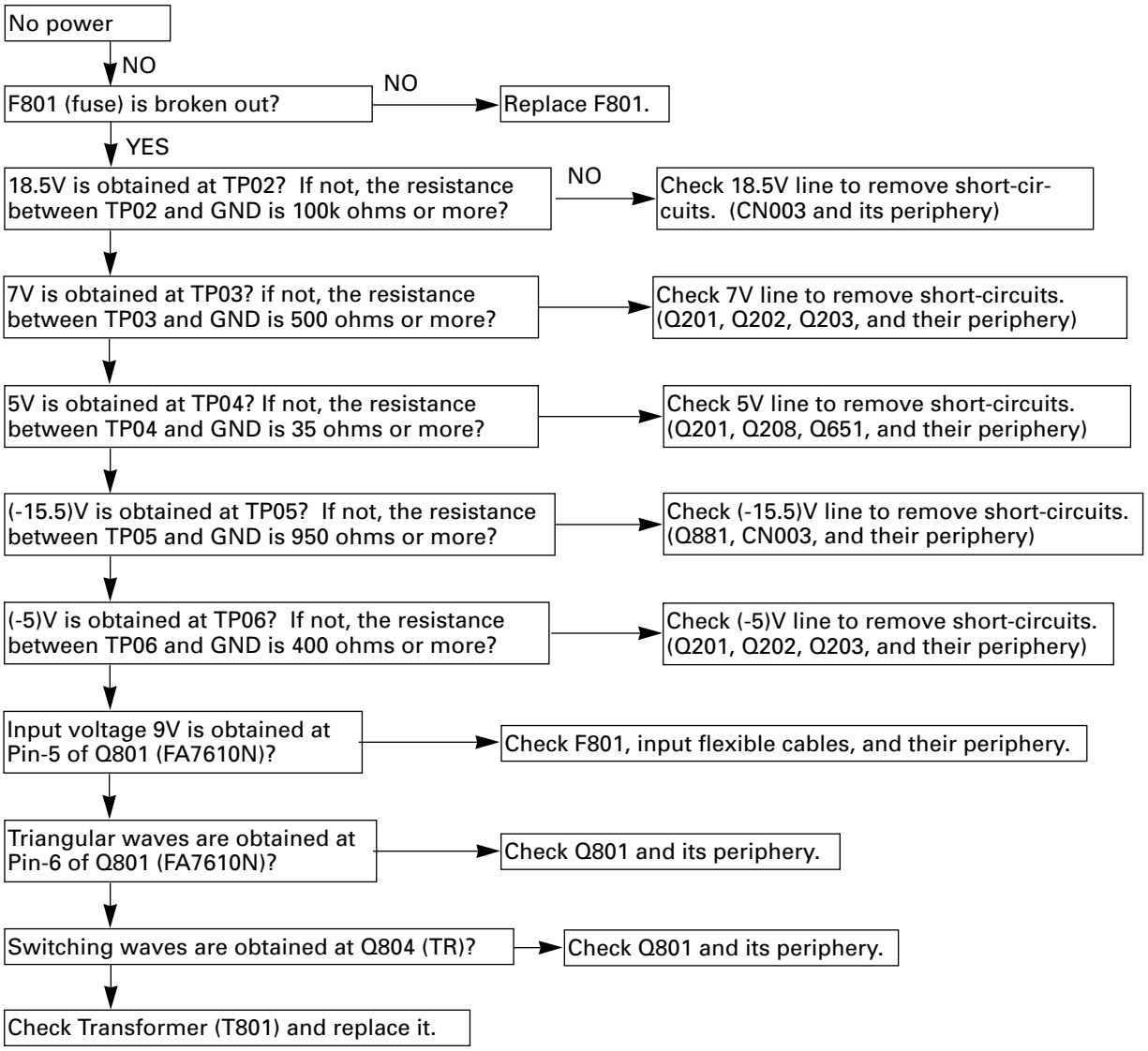




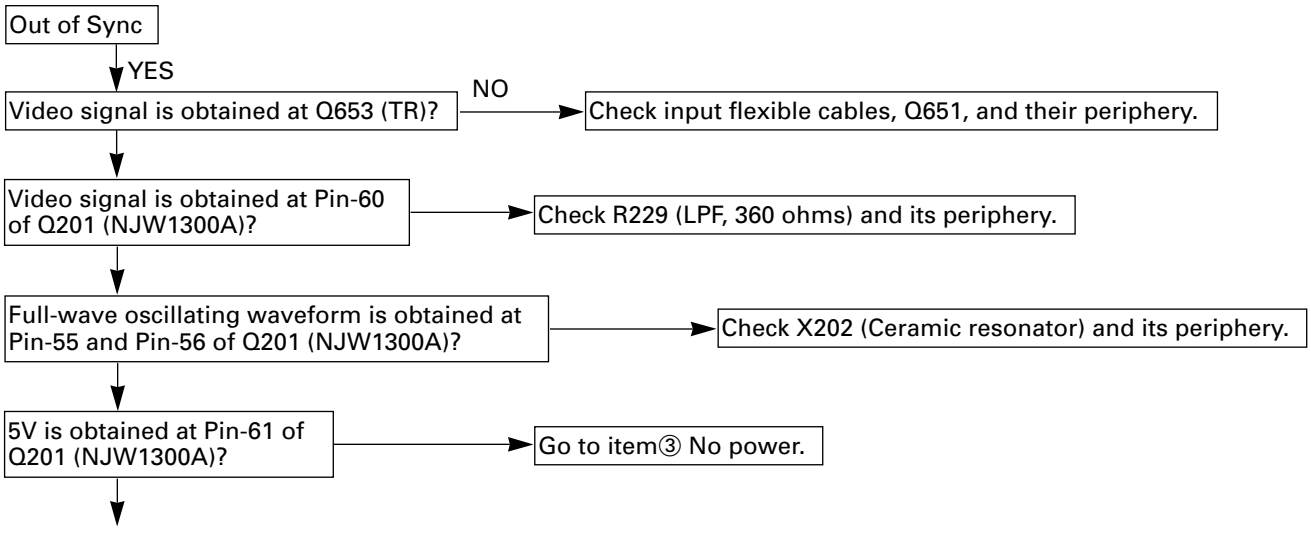
②Back light doesn't turn ON.

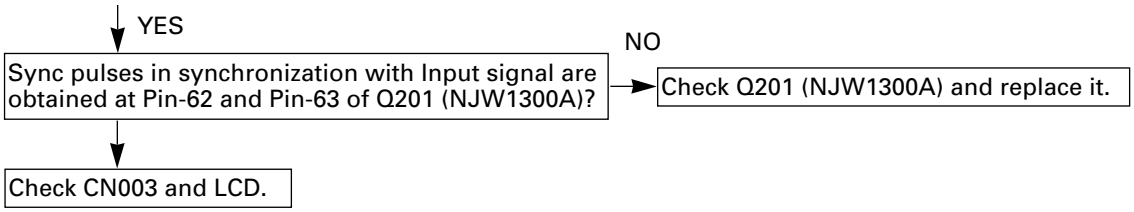


③No power

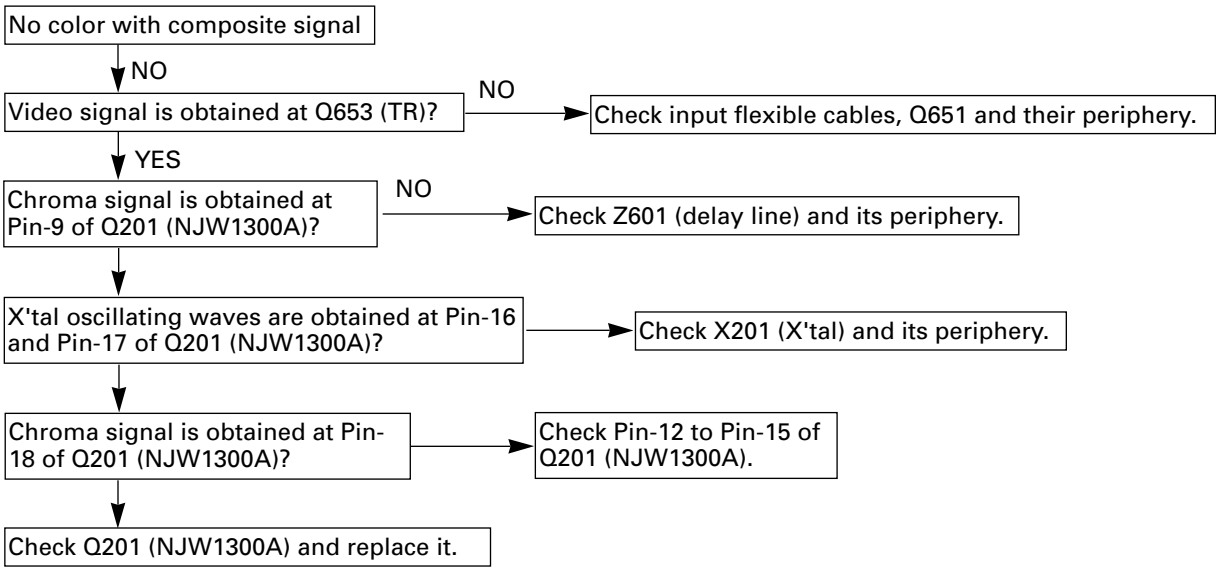


④Out of Sync

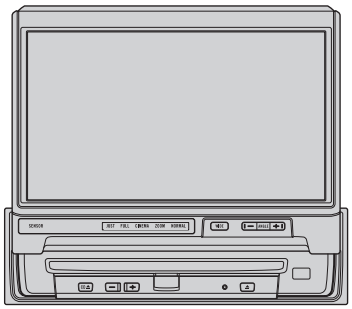




⑤No color with Composite signal



Service Manual



ORDER NO.
CRT2379

7 INCH WIDE AV SYSTEM DISPLAY/CD PLAYER

AVX-P7000CD UC

AVX-P7000CD EW

AVX-P7000CD ES

COMPACT disc DIGITAL AUDIO

NOTE:

- See the separate manual CX-680(CRT2216) for the cassette mechanism description.
- The CD mechanism assy employed in this model is one of H1 series.
- For the details of the LCD module and the drive mech unit, refer to the separate manual CRT2276.

CONTENTS

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS SERVICE INC. P.O.Box 1760, Long Beach, CA 90801-1760 U.S.A.
PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE.LTD. 253 Alexandra Road, #04-01, Singapore 159936

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● CD Player Service Precautions

1. For pickup unit(CXX1290) handling, please refer to"Disassembly"(see page 55).
   During replacement, handling precautions shall be taken to prevent an electrostatic discharge(protection by a short pin).
2. During disassembly, be sure to turn the power off since an internal IC might be destroyed when a connector is plugged or unplugged.
3. Please checking the grating after changing the service pickup unit(see page 46).

1. SAFETY INFORMATION

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty.
If you are not qualified to perform the repair of this product properly and safely, you should mot risk trying to do so and refer the repair to a qualified service technician.

WARNING

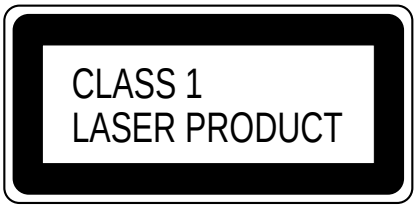
This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.
Health & Safety Code Section 25249.6 - Proposition 65

1. Safety Precautions for those who Service this Unit.

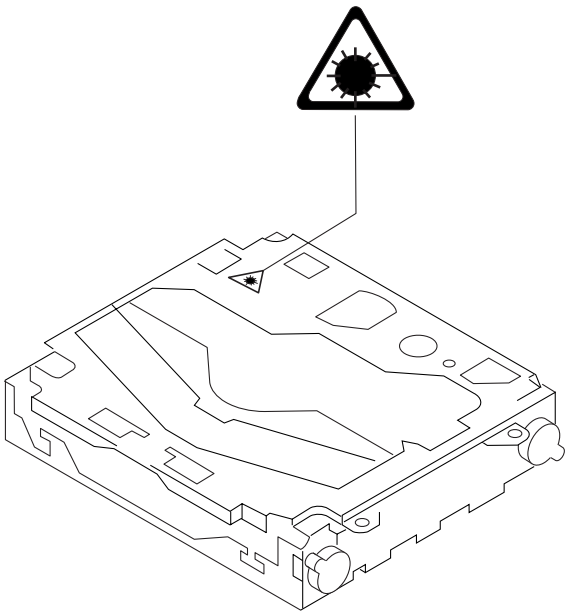
- When checking or adjusting the emitting power of the laser diode exercise caution in order to get safe, reliable results.

Caution:
1. During repair or tests, minimum distance of 13cm from the focus lens must be kept.
2. During repair or tests, do not view laser beam for 10 seconds or longer.

2. A “CLASS 1 LASER PRODUCT” label is affixed to the rear of the player.



3. The triangular label is attached to the mechanism unit frame.

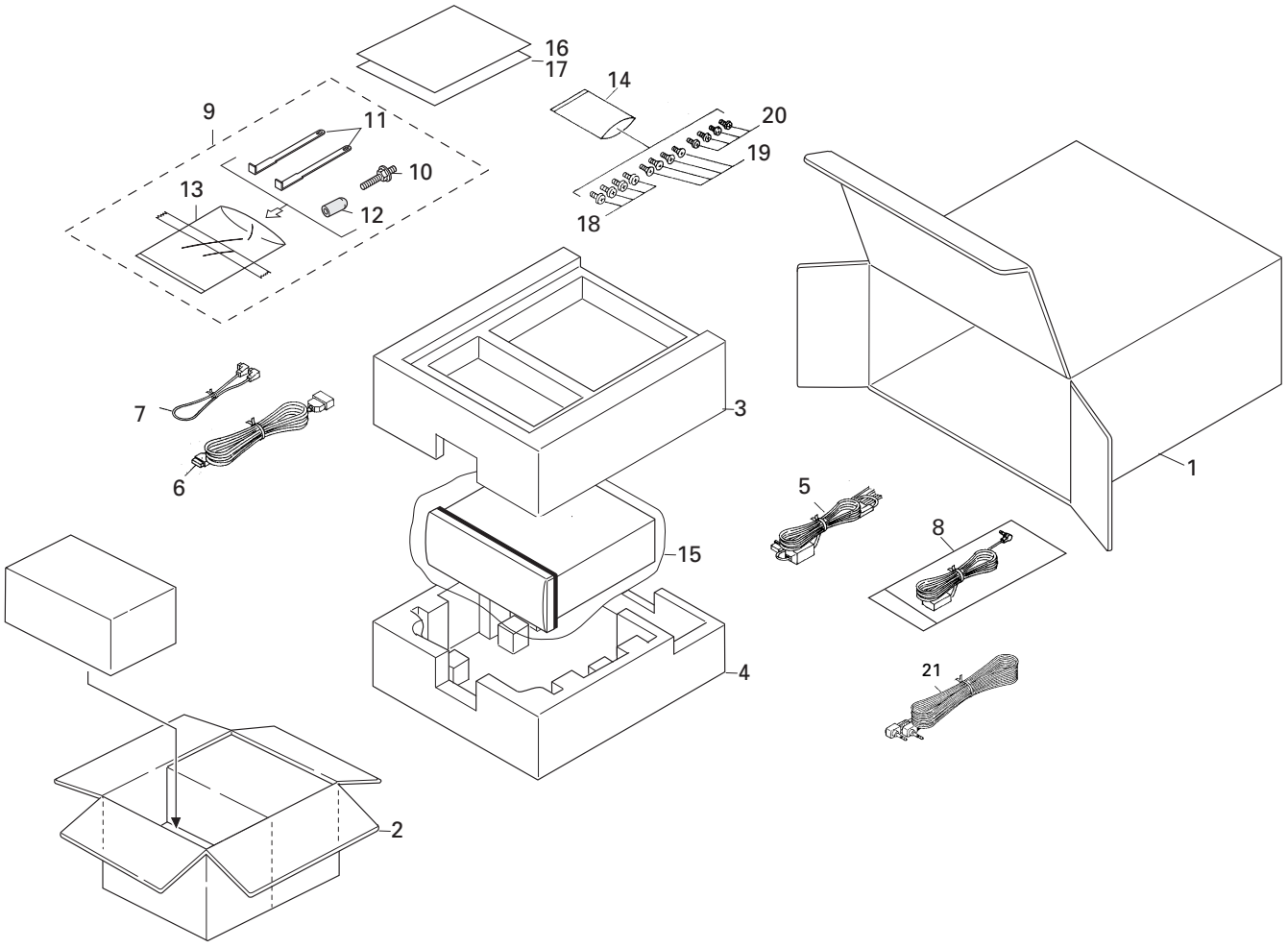


4. Specifications of Laser Diode

Specifications of laser radiation fields to which human access is possible during service.
Wavelength = 800 nanometers

2. EXPLODED VIEWS AND PARTS LIST

2.1 PACKING



NOTE:

- Parts marked by "*" are generally unavailable because they are not in our Master Spare Parts List.
- Screws adjacent to ∇ mark on the product are used for disassembly.

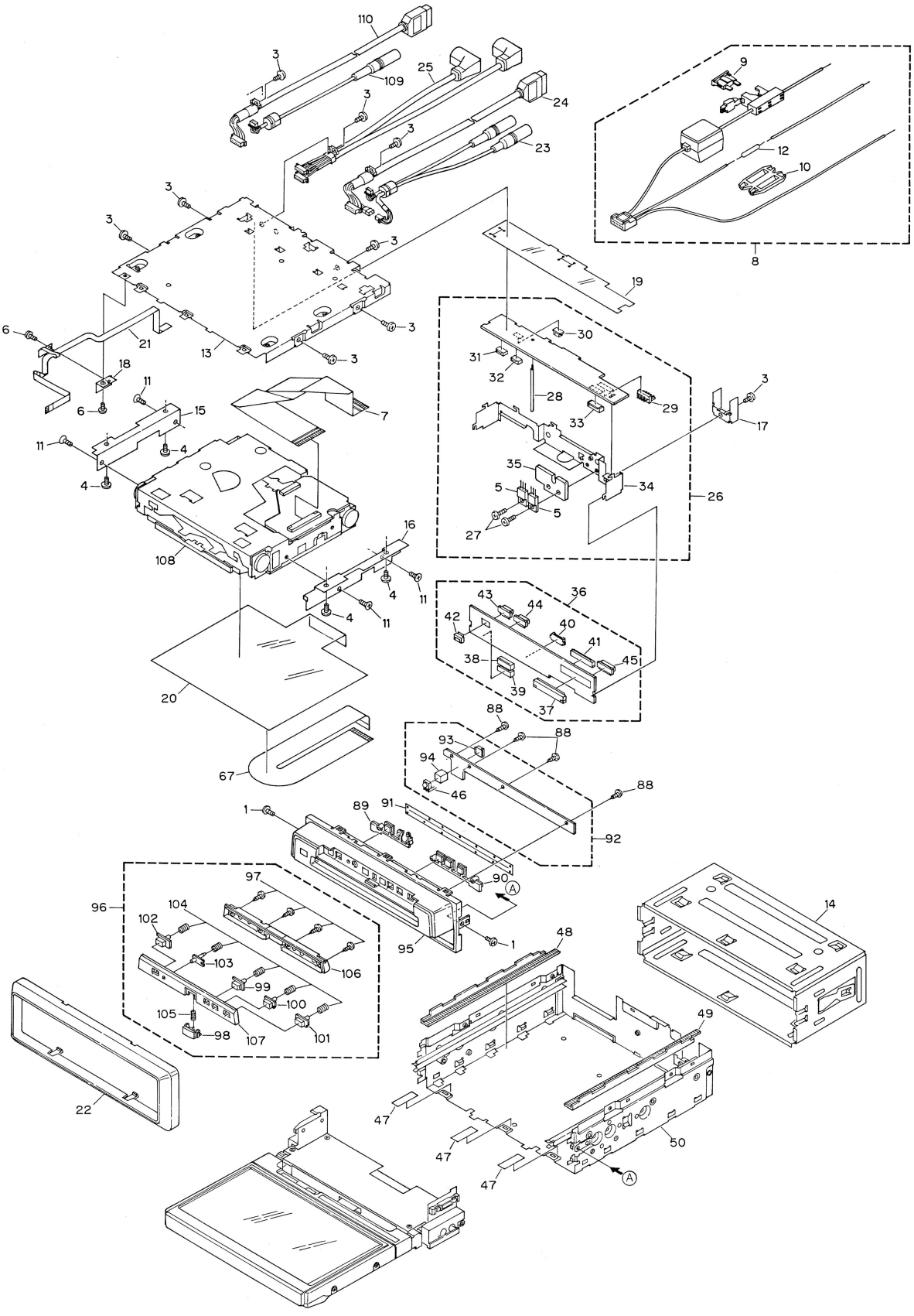
● PACKING SECTION PARTS LIST

Mark	No.	Description	Part No. AVX-P7000CD/UC	AVX-P7000CD/EW	AVX-P7000CD/ES
	1	Carton	CHG3804	CHG3802	CHG3803
	2	Contain Box	CHL3804	CHL3802	CHL3803
	3	Protector	CHP2163	CHP2163	CHP2163
	4	Protector	CHP2164	CHP2164	CHP2164
	5	Cord Assy	CDE5930	CDE5930	CDE5930
	6	Cord Assy	CDE5908	CDE5908	CDE5908
	7	Cord Assy	CDE6033	CDE6033	CDE6033
	8	Speaker Assy	CXB4203	CXB4203	Not used
	9	Accessory Assy	CEA2547	CEA2547	CEA2547
	10	Screw	CBA1002	CBA1002	CBA1002
	11	Handle	CNC5395	CNC5395	CNC5395
	12	Bush	CNV1917	CNV1917	CNV1917
*	13	Polyethylene Bag	E36-615	E36-615	E36-615
*	14	Polyethylene Bag	CEG-127	CEG-127	CEG-127
	15	Polyethylene Bag	CEG1173	CEG1042	CEG1042
	16-1	Owner's Manual	CRD3011	CRD3013	CRD3044
	16-2	Owner's Manual	Not used	CRD3014	Not used
	16-3	Installation Manual	Not used	CRD3015	Not used
*	16-4	Warranty Card	Not used	CRY1087	Not used
*	16-5	Card	ARY1048	Not used	Not used
	17	Polyethylene Bag	Not used	CEG1116	Not used
	18	Screw	CBA1468	CBA1468	CBA1468
	19	Screw	CMZ50P060FMC	CMZ50P060FMC	CMZ50P060FMC
	20	Screw	BMZ50P060FMC	BMZ50P060FMC	BMZ50P060FMC
	21	Cord Assy	CDE5939	CDE5939	CDE5939

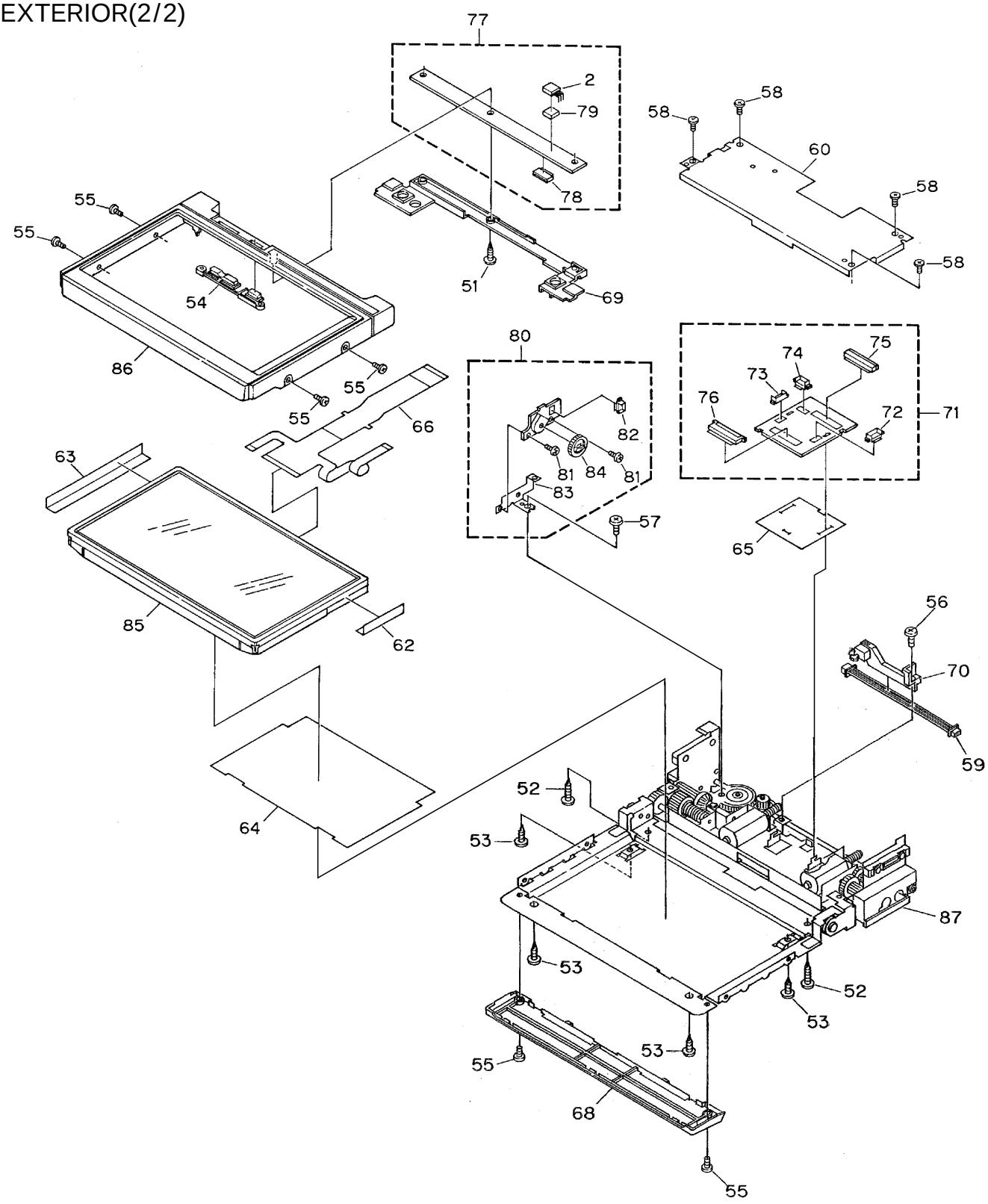
● Owner's Manual and Installation Manual

Model	Part No.	Language
AVX-P7000CD/UC	CRD3011	English,French
AVX-P7000CD/EW	CRD3013	English,Spanish,German
	CRD3014	French,Italian,Dutch
	CRD3015	English,Spanish,Dutch,German,French,Italian
AVX-P7000CD/ES	CRD3044	English,Spanish

2.2 EXTERIOR(1/2)



EXTERIOR(2/2)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(1) EXTERIOR SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Screw	BMZ26P050FZK
	2	IC(IC24)	PNA4603H00LB
	3	Screw	BSZ26P040FMC
	4	Screw	BSZ30P040FMC
	5	Transistor(Q1801,Q1809)	2SD2396
	6	Screw(M2x2)	CBA1487
	7	Connector	CDE5925
	8	Cord Assy	CDE5930
	9	Fuse(4A)	CEK1001
	10	Cap	CNS1472
	11	Screw	UFZ26P030FMC
	12	Resistor	RS1/2PMF102J
	13	Case	CNB2458
	14	Holder	CNC6798
	15	Bracket	CNC8260
	16	Bracket	CNC8261
	17	Holder	CNC8359
	18	Holder	CNC8387
	19	Insulator	CNM6199
	20	Insulator	CNM6201
	21	PCB	CNP5539
	22	Panel	See Contrast table(2)
	23	Cord Assy	See Contrast table(2)
	24	Cord Assy	See Contrast table(2)
	25	Cord Assy	CDE6138
	26	System Micro Computer Unit	See Contrast table(2)
	27	Screw	ASZ26P100FMC
	28	Clamper	CEF1009
	29	Plug(CN1801)	CKS-461
	30	Connector(CN1604)	CKS3125
	31	Connector(CN1601)	CKS4064
	32	Connector(CN1602)	CKS4064
	33	Connector(CN1603)	CKS4066
	34	Holder	CNC8259
	35	Heat Sink	CNC8262
	36	CD Micro Computer Unit	CWM6444
	37	Connector(CN2601)	CKS1968
	38	Connector(CN2002)	CKS3132
	39	Connector(CN2001)	CKS3133
	40	Connector(CN2901)	CKS3133
	41	Connector(CN2902)	CKS3971
	42	Connector(CN2602)	CKS4054
	43	Connector(CN2603)	CKS4063
	44	Connector(CN2604)	CKS4063
	45	Connector(CN2605)	CKS4065
	46	IC(IC1)	SBX8035-H
	47	Spacer	CNM6200
	48	Rack	CNV5737
	49	Rack	CNV5738
	50	Chassis Unit	CXB3769
	51	Screw	BPZ20P100FMC
	52	Screw	BPZ20P120FZK
	53	Screw	BPZ26P050FMC
	54	Button(ANGEL,WIDE)	See Contrast table(2)
	55	Screw	See Contrast table(2)
	56	Screw	CBA1481
	57	Screw	CBA1482
	58	Screw	CBA1484
	59	Connector	CDE5924
	60	Case	CNC8405
	61	•••••	
	62	Insulator	CNM6314
	63	Insulator	CNM6315
	64	Insulator	CNM6339
	65	Insulator	CNM6340
	66	PCB	CNP5449
	67	PCB	CNP5451
	68	Cover	See Contrast table(2)
	69	Holder	CNV5744
	70	Holder	CNV5842
	71	Relay Unit	CWM6425
	72	Connector(CN52)	CKS3124
	73	Connector(CN53)	CKS3124
	74	Connector(CN57)	CKS3125
	75	Connector(CN51)	CKS3802
	76	Connector(CN55)	CKS4132
	77	LCD Keyboard Unit	See Contrast table(2)
	78	Connector(CN21)	CKS4057
	79	Spacer	CNM6271
	80	Encoder Unit	CWM6587
	81	Screw	CBA1483
	82	Connector(CN56)	CKS3125
	83	Bracket	CNC8406
	84	Gear	CNV5841
	85	LCD Module	CWX2389
	86	Grille Unit	See Contrast table(2)
	87	Drive Mechanism Unit	See Contrast table(2)
	88	Screw	BPZ20P060FMC
	89	Button	CAC6025
	90	Button	CAC6026

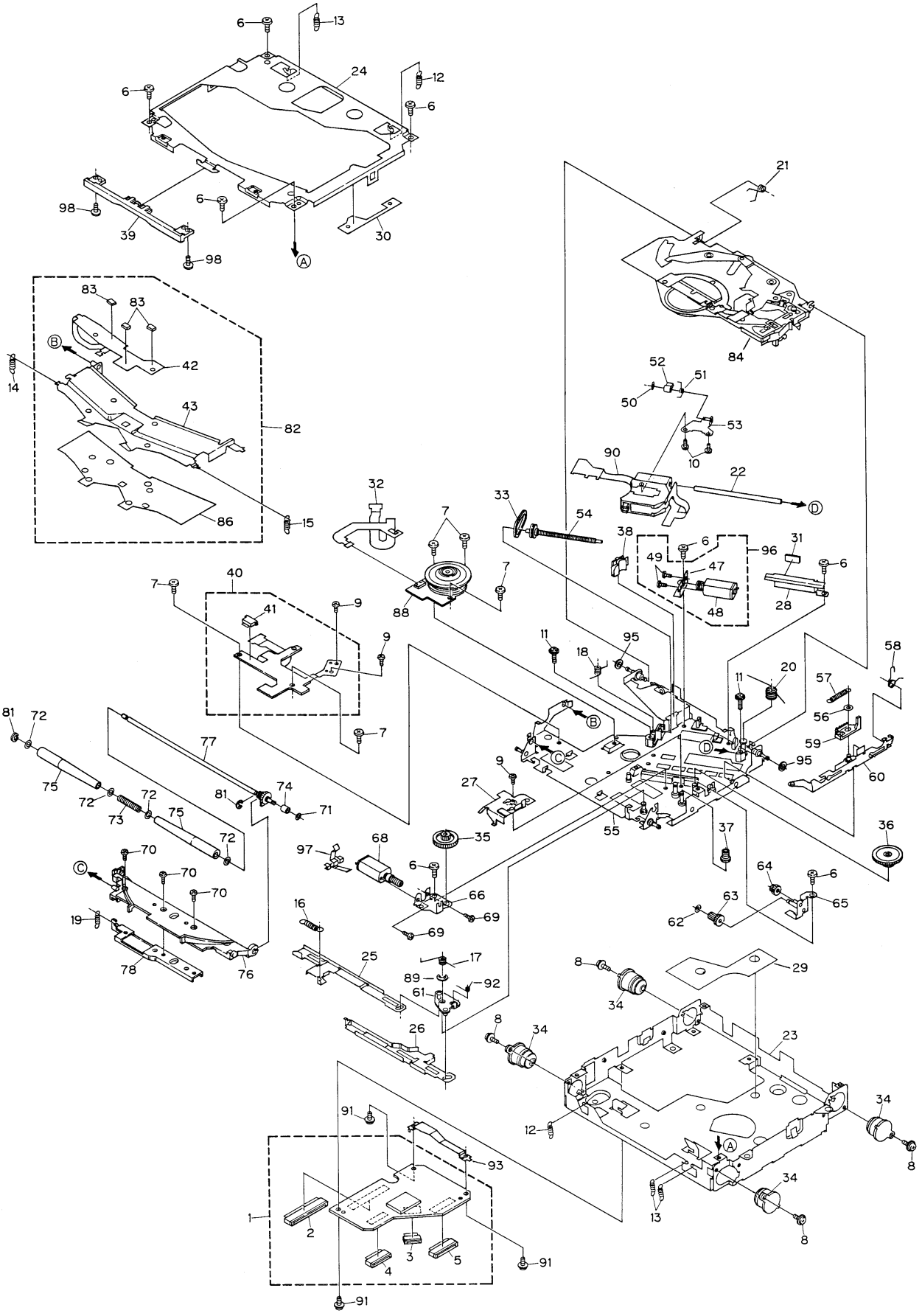
Mark	No.	Description	Part No.
*	91	Cover	CNM6470
	92	Panel Keyboard Unit	See Contrast table(2)
	93	Connector(CN1)	CKS4054
	94	Spacer	CNM6272
	95	Grille Unit	See Contrast table(2)
	96	Detach Grille Assy	See Contrast table(2)
	97	Screw	BPZ20P060FZK
	98	Button(Detach)	See Contrast table(2)
	99	Button(+)	See Contrast table(2)
	100	Button(-)	See Contrast table(2)
	101	Button(CD EJECT)	See Contrast table(2)
	102	Button(OPEN/CLOSE)	See Contrast table(2)
	103	Button(RESET)	See Contrast table(2)
	104	Spring	CBH2239
	105	Spring	CBH2302
	106	Cover	See Contrast table(2)
	107	Grille	See Contrast table(2)
	108	CD Mechanism Module(H1)	CXK5141
	109	Cord Assy	See Contrast table(2)
	110	Cord Assy	See Contrast table(2)

(2) CONTRAST TABLE

AVX-P7000CD/UC , AVX-P7000CD/EW and AVX-P7000CD/ES are constructed the same except for the following:

Mark	No.	Description	Part No.		
			AVX-P7000CD/UC	AVX-P7000CD/EW	AVX-P7000CD/ES
	22	Panel	CNS5427	CNS5427	CNS5550
	23	Cord Assy	CDE5934	CDE5934	Not used
	24	Cord Assy	CDE6030	CDE6030	Not Used
	26	System Micro Computer Unit	CWM6430	CWM6431	CWM6430
	54	Button	CAC6107	CAC6107	CAC6024
	55	Screw	CBA1477	CBA1477	CBA1475
	68	Cover	CNS5499	CNS5499	CNS5420
	77	LCD Keyboard Unit	CWM6426	CWM6427	CWM6426
	86	Grille Unit	CXB4533	CXB4533	CXB4534
	87	Drive Mechanism Unit	CXB4204	CXB4204	CXB4205
	92	Panel Keyboard Unit	CWM6439	CWM6438	CWM6439
	95	Grille Unit	CXB4554	CXB4554	CXB4551
	96	Detach Grille Assy	CXB4227	CXB4226	CXB4228
	98	Button	CAC6031	CAC6031	CAC6151
	99	Button	CAC6108	CAC6108	CAC6027
	100	Button	CAC6109	CAC6109	CAC6028
	101	Button	CAC6110	CAC6110	CAC6029
	102	Button	CAC6111	CAC6111	CAC6030
	103	Button	CAC6112	CAC6112	CAC6032
	106	Cover	CNS5503	CNS5503	CNS5424
	107	Grille	CNS5504	CNS5502	CNS5505
	109	Cord Assy	Not used	Not used	CDE5937
	110	Cord Assy	Not used	Not used	CDE6070

2.3 CD MECHANISM MODULE

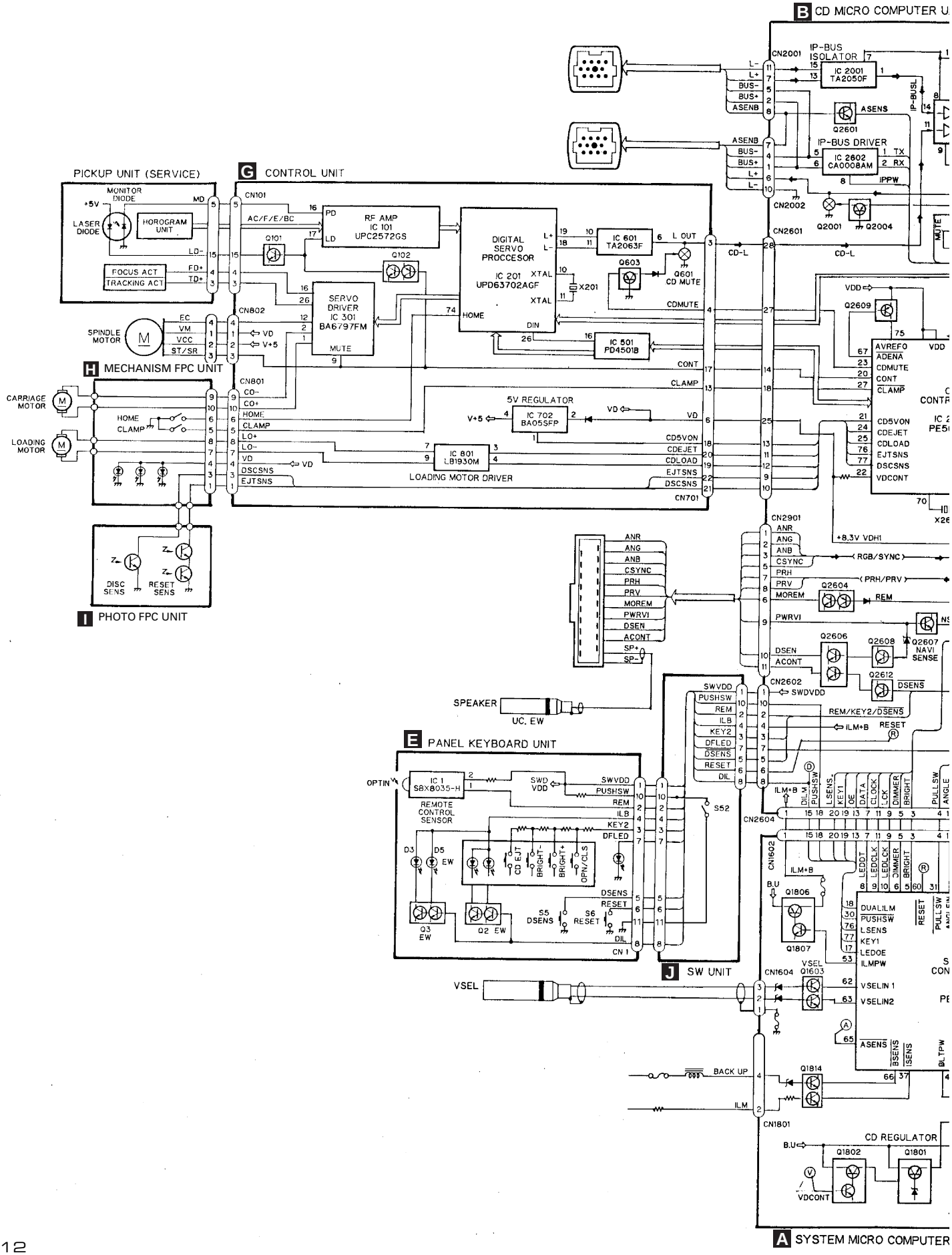


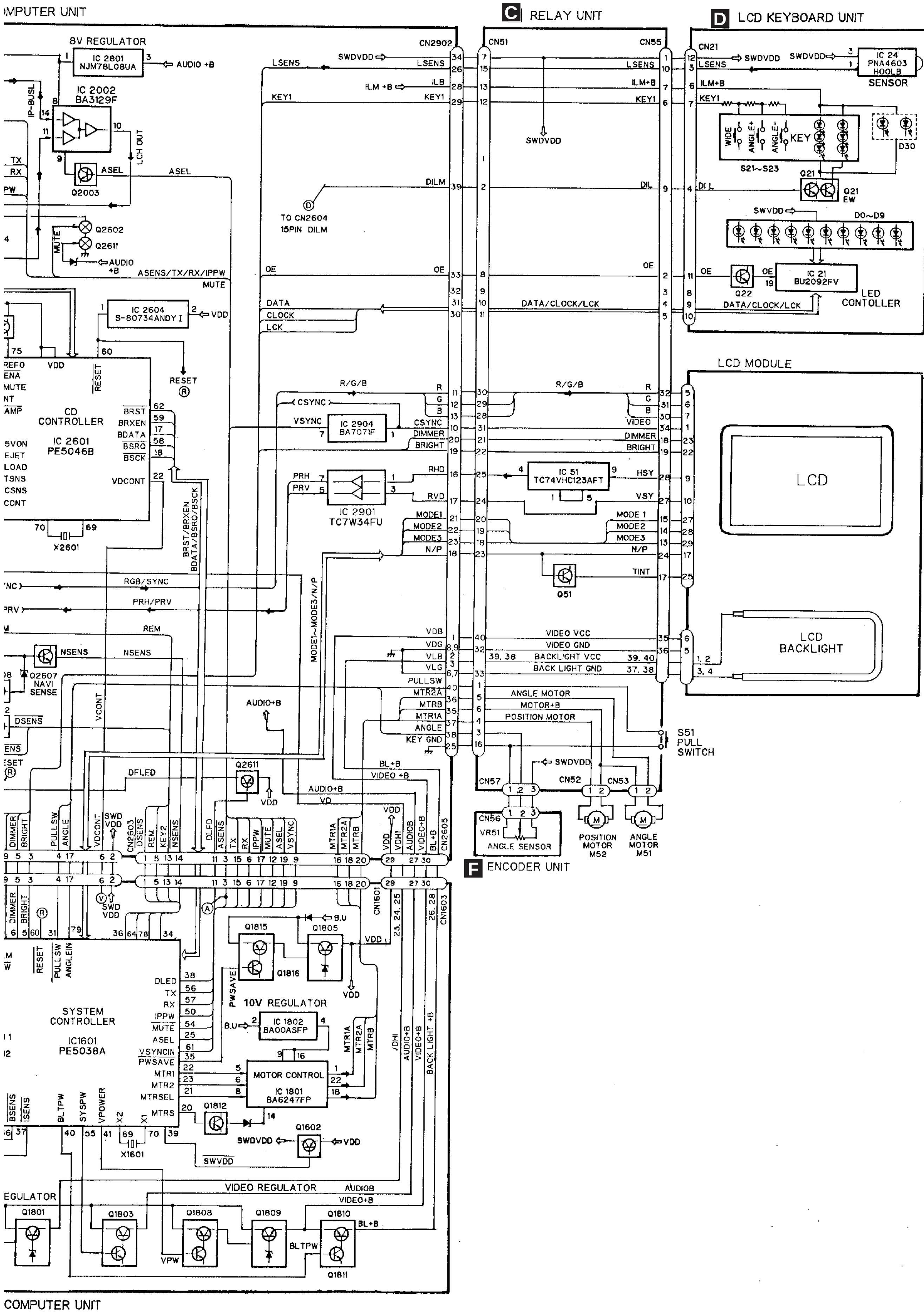
● CD MECHANISM MODULE SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Control Unit	CWX2350
	2	Connector(CN701)	CKS1968
	3	Connector(CN802)	CKS3477
	4	Connector(CN801)	CKS3481
	5	Connector(CN101)	CKS3486
	6	Screw	BMZ20P025FMC
	7	Screw(M2×2.5)	CBA1037
	8	Screw(M2×5)	CBA1296
	9	Screw(M2×1.8)	CBA1340
	10	Screw(M2×4)	CBA1362
	11	Screw(M2×9)	CBA1440
	12	Spring	CBH2029
	13	Spring	CBH2030
	14	Spring	CBH2031
	15	Spring	CBH2032
	16	Spring	CBH2033
	17	Spring	CBH2207
	18	Spring	CBH2040
	19	Spring	CBH2041
	20	Spring	CBH2042
	21	Spring	CBH2052
	22	Shaft	CLA3232
	23	Frame	CNC8264
	24	Frame	CNC7286
	25	Lever	CNC7288
	26	Lever	CNC7289
	27	Cover	CNC7294
	28	Cover	CNC7304
	29	Sheet	CNM5401
	30	Sheet	CNM5402
	31	Sheet	CNM5814
	32	PCB	CNP4854
	33	Belt	CNT1082
	34	Damper	CNV5855
	35	Gear	CNV5080
	36	Gear	CNV5081
	37	Gear	CNV5082
	38	Holder	CNV5098
	39	Guide	CNV5352
	40	Mechanism FPC Unit	CWX2191
	41	Connector	CKS3767
*	42	PCB	CNP4852
*	43	Arm	CNC7287
	44	•••••	
	45	•••••	
	46	•••••	
	47	Bracket	CNC7300
*	48	CRG Motor Unit	CXB1671
	49	Screw	JFZ14P020FNI
	50	Washer	CBF1037
	51	Spring	CBH2039
	52	Rack	CNV5471
	53	Bracket Unit	CXB1674
	54	Screw Unit	CXB1676
	55	Chassis Unit	CXB3042
	56	Washer	CBF1038
	57	Spring	CBH2035
	58	Spring	CBH2036
	59	Lever	CNV5078
	60	Lever Unit	CXB3207
	61	Arm Unit	CXB1680
	62	Washer	CBF1038
	63	Gear	CNV5083
	64	Gear	CNV5084
	65	Bracket Unit	CXB1682
	66	Bracket	CNC7292
	67	•••••	
	68	LOAD Motor Unit(M2)	CXB1684
	69	Screw	JFZ14P020FNI
	70	Screw(M2×2)	CBA1451
	71	Washer	CBF1037
	72	Washer	CBF1060
	73	Screw	CBH2170
	74	Roller	CLA3222
	75	Roller	CNV3412
	76	Arm	CNV5075
	77	Roller Gear Unit	CXB1686
	78	Bracket Unit	CXB2627
	79	•••••	
	80	•••••	
	81	Washer	YE20FUC
	82	Guide Arm Assy	CXB1688
	83	Photo-transistor(P1-3)	CPT-230S-X
	84	Clamp Arm Assy	CXB3137
	85	•••••	
*	86	Sheet	CNM5398
	87	•••••	
	88	Motor(M3)	CXM1129
	89	Washer	YE25FUC
	90	Pickup Unit(Service)	CXX1290
	91	Screw	IMS20P035FMC
	92	Spring	CBH2206
	93	Bracket	CNC7977
	94	•••••	
	95	Sheet	CNM6055
	96	CRG Motor Assy(M1)	CXB1670
	97	Spring	CBL1412
	98	Screw	IMS20P025FMC

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

3.1 BLOCK DIAGRAM

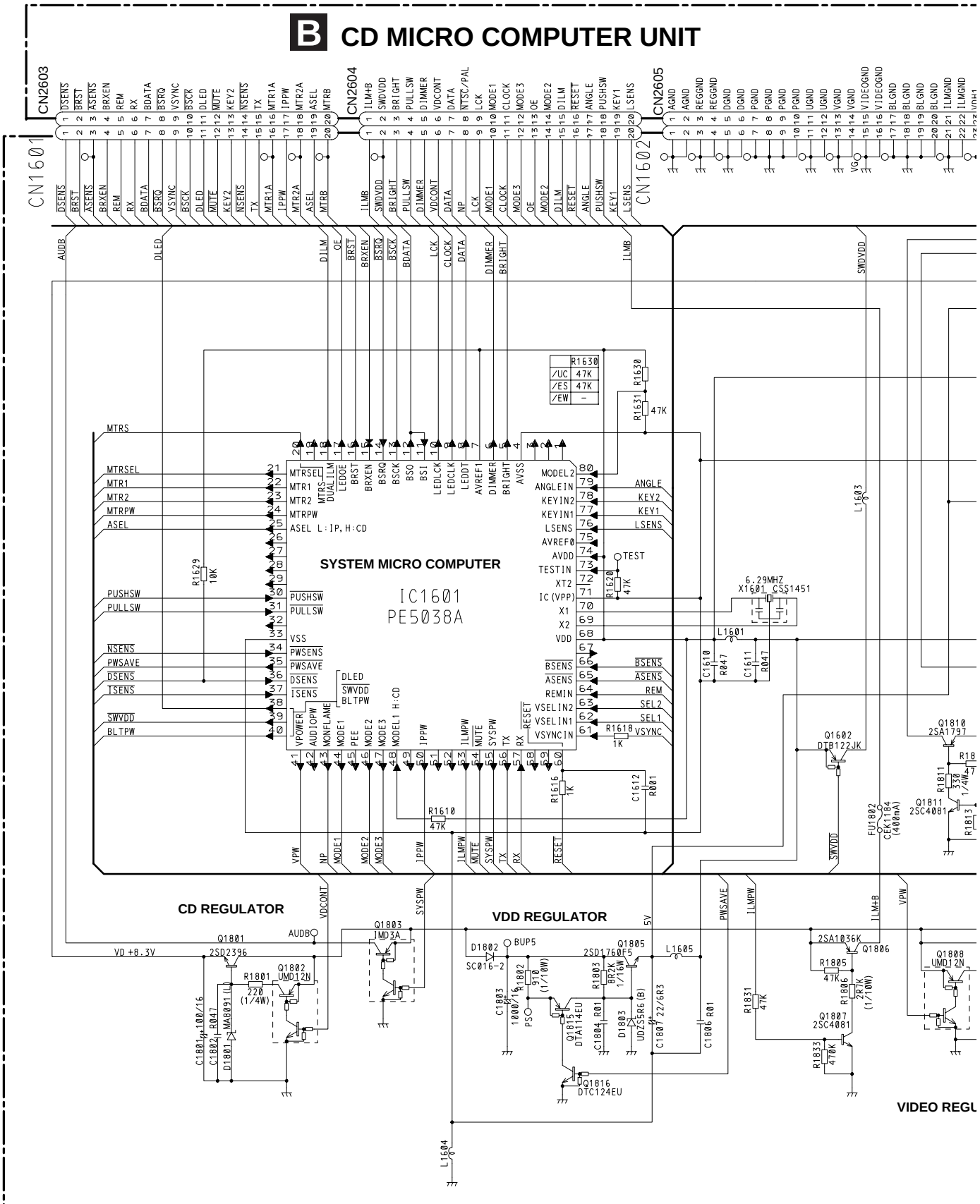




MPUTER UNIT
C RELAY UNIT
D LCD KEYBOARD UNIT
8V REGULATOR
IC 2801 NJM78L08UA
IC 2002 BA3129F
IC 2604 S-80734ANDY I
CD CONTROLLER
IC 2601 PE5046B
X2601
IC 2904 BA7071F
IC 2901 TC7W34FU
IC 51 TC74VHC123AFT
IC 24 PNA4603 HOOLB
SENSOR
IC 21 BU2092FV
LED CONTOLLER
LCD MODULE
LCD
LCD BACKLIGHT
TO CN2604 15PIN DILM
S51 PULL SWITCH
ANGLE SENSOR
POSITION MOTOR M52
ANGLE MOTOR M51
F ENCODER UNIT
SYSTEM CONTROLLER
IC1601 PE5038A
10V REGULATOR
IC 1802 BA00ASFP
MOTOR CONTROL
IC 1801 BA6247FP
X1601
VIDEO REGULATOR
EGULATOR
COMPUTER UNIT

3.2 SYSTEM MICRO COMPUTER UNIT

Note: When ordering service parts, be sure to refer to "EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".



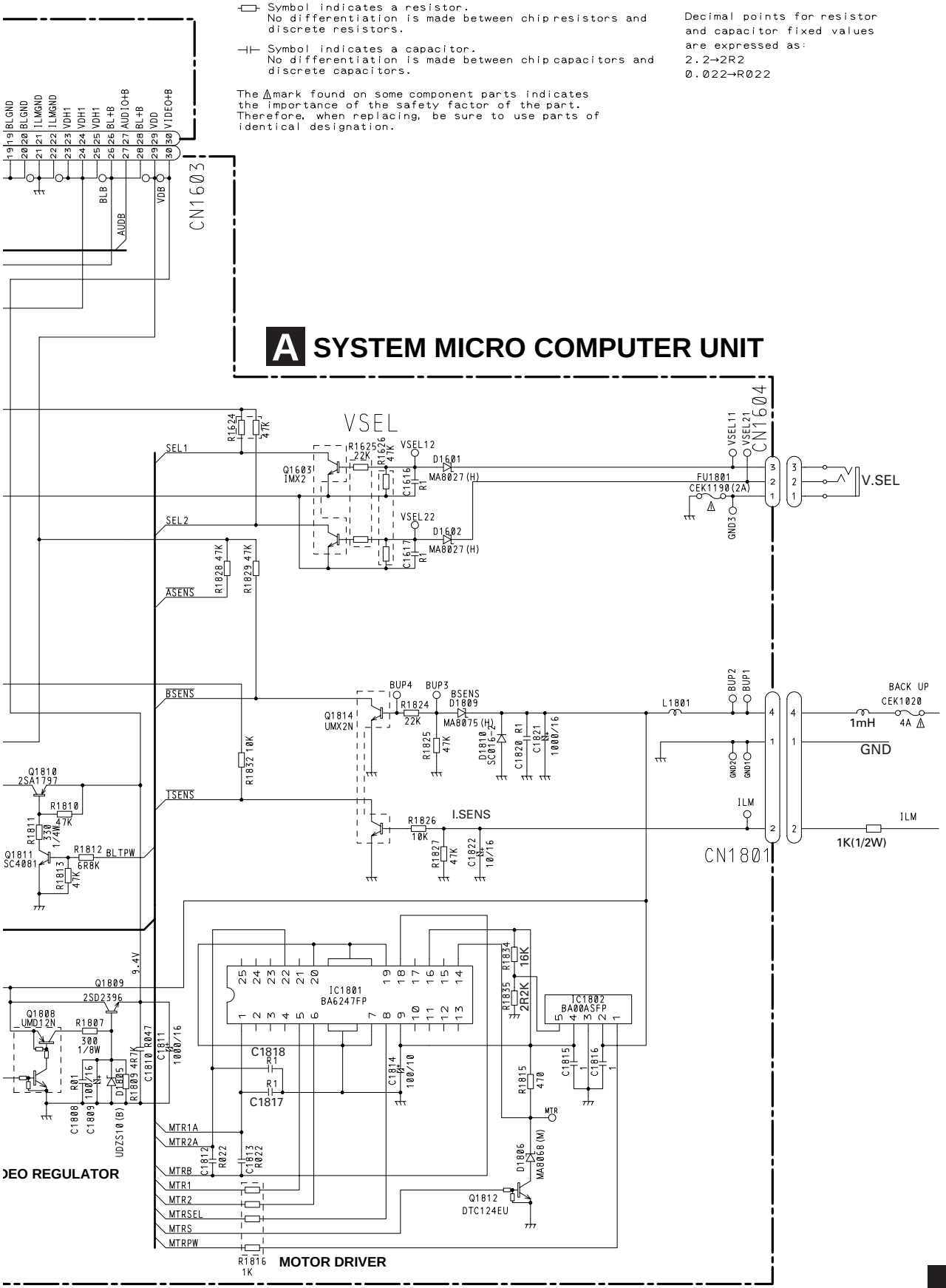
NOTE :

Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

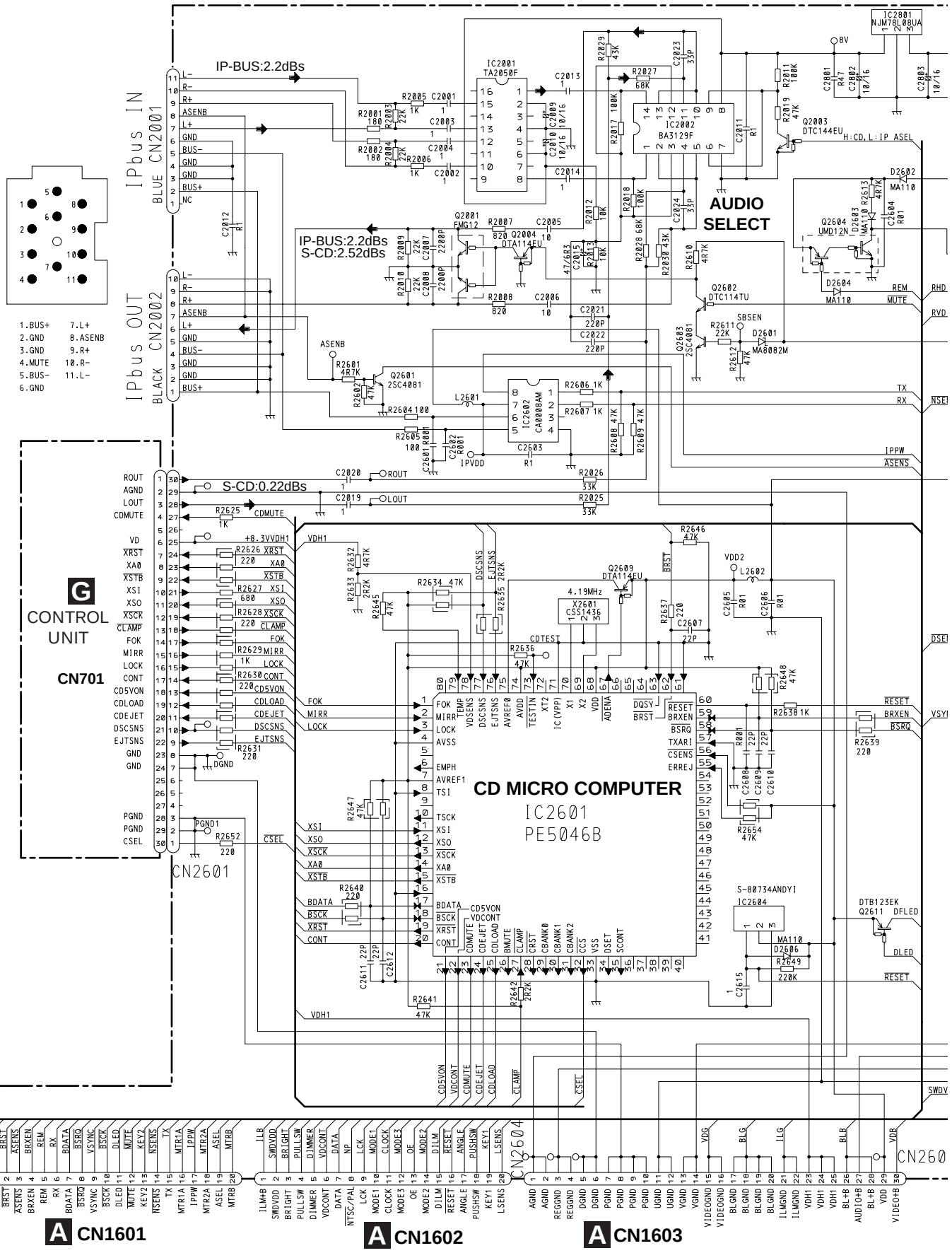
Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

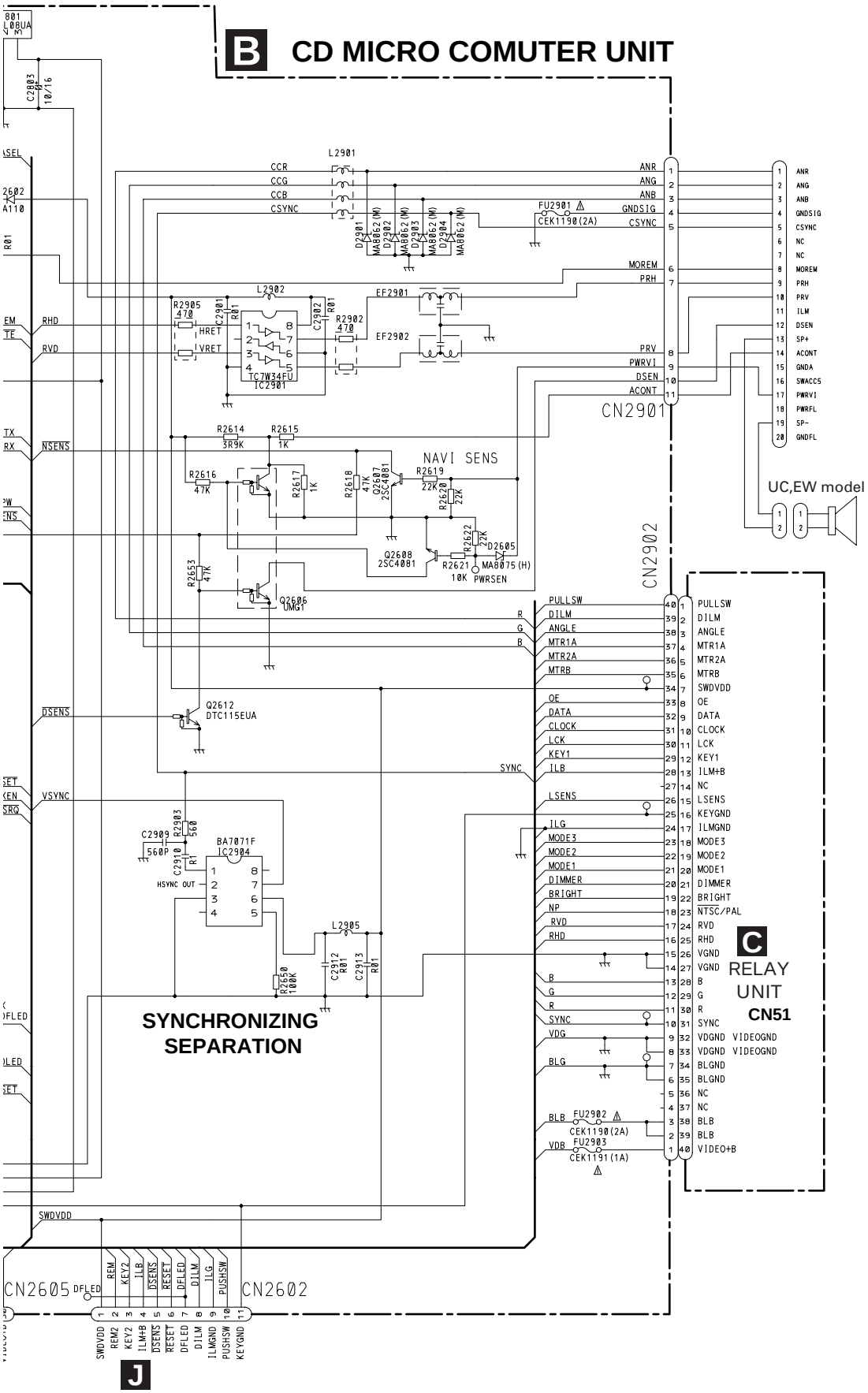
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

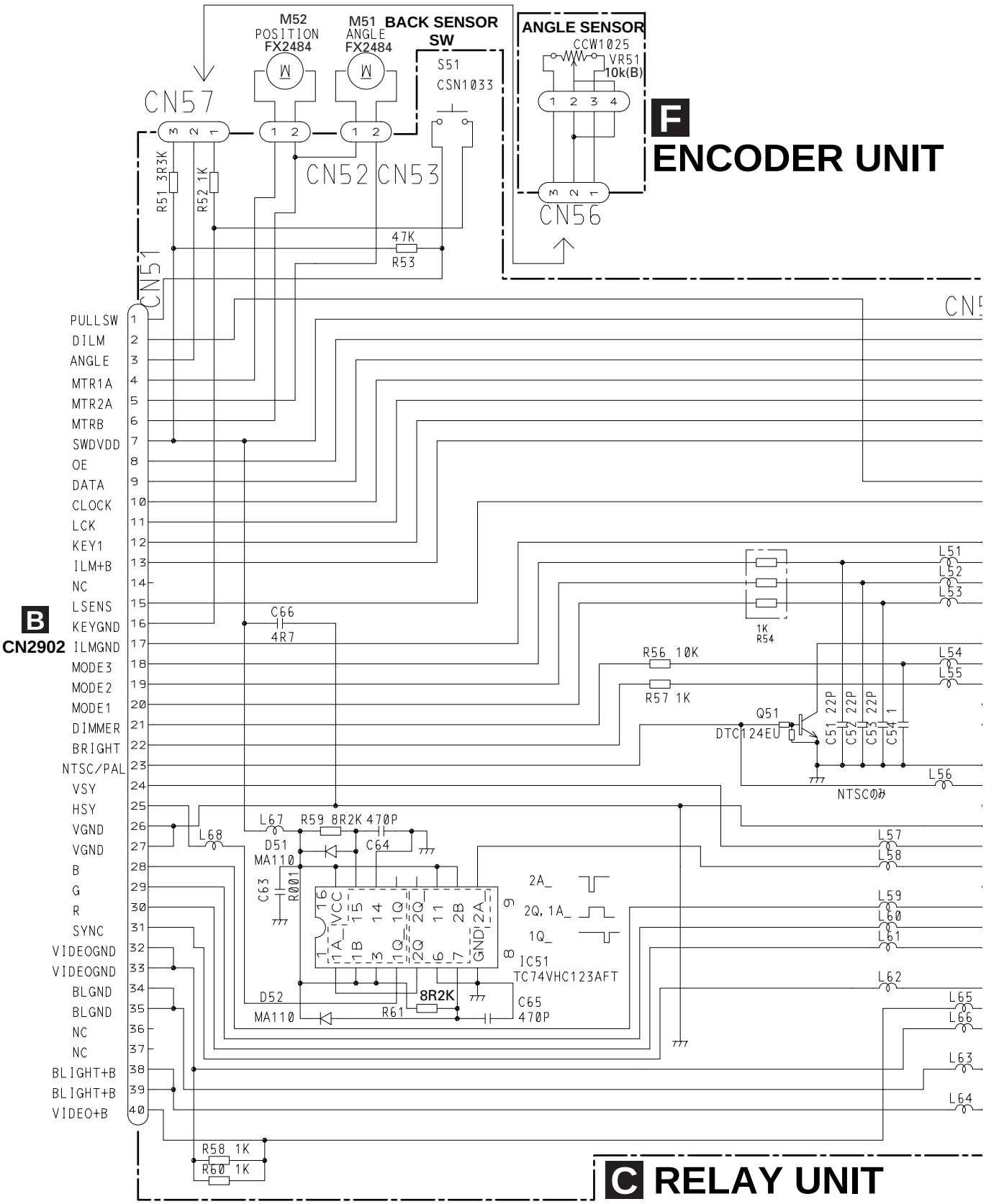


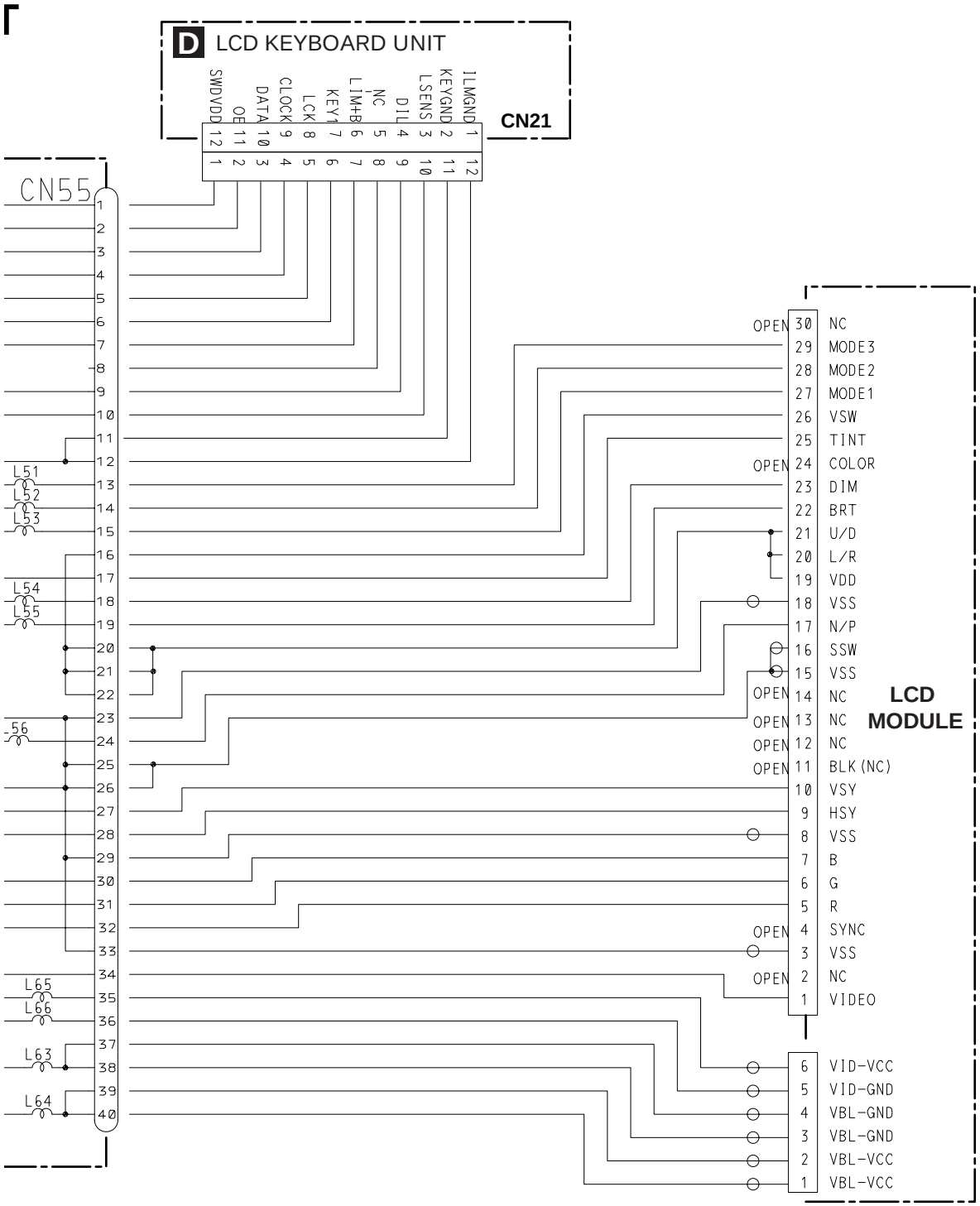
3.3 CD MICRO COMPUTER UNIT



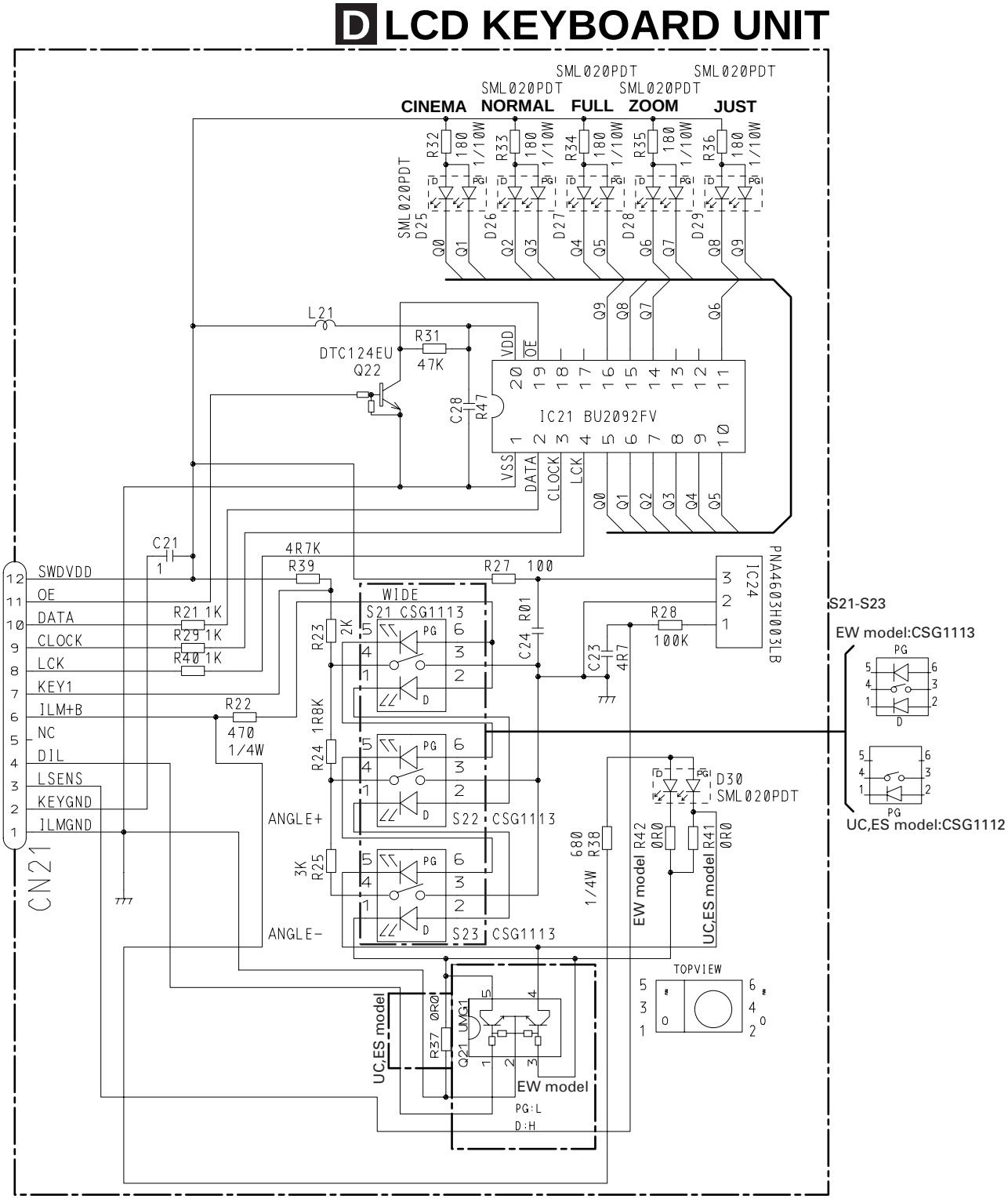

B
CD MICRO COMUTER UNIT
L2901
CCR
CCG
CCB
CSYNC
ANR
ANG
ANB
GNDSIG
CSYNC
FU2901
CEK1190(2A)
D2901 MA8062(M)
D2902 MA8062(M)
D2903 MA8062(M)
D2904 MA8062(M)
MOREM
PRH
PRV
PWRVI
DSEN
ACONT
CN2901
L2902
EF2901
EF2902
R2905 470
R2902 470
C2901 R01
C2902 R01
HRET
VRET
TC7W34FU
IC2901
RHD
RVD
R2614 3R9K
R2615 1K
NSENS
NAVI SENS
R2616 47K
R2617 1K
R2618 47K
Q2607 2SC4081
R2619 22K
R2620 22K
R2622 22K
D2605
Q2608 2SC4081
R2621 10K
MA8075(H)
PWRSEN
R2653 47K
Q2606 UMG1
UC,EW model
CN2902
PULLSW
DILM
ANGLE
MTR1A
MTR2A
MTRB
SWDVDD
OE
DATA
CLOCK
LCK
KEY1
ILB
ILM+B
NC
LSENS
KEYGND
ILMGND
MODE3
MODE2
MODE1
DIMMER
BRIGHT
NTSC/PAL
RVD
RHD
VGND
VGND
B
G
R
SYNC
VDGND VIDEOGND
VDGND VIDEOGND
BLGND
BLGND
NC
NC
BLB
BLB
VIDEO+B
FU2902
CEK1190(2A)
VDB
FU2903
CEK1191(1A)
C
RELAY UNIT
CN51
Q2612 DTC115EUA
DSENS
VSYNC
SYNC
C2909 560P
R2903 560
C2910 R1
BA7071F
IC2904
HSYNC OUT
L2905
C2912 R01
C2913 R01
R2650 100K
SYNCHRONIZING SEPARATION
SWDVDD
CN2605
DFLED
REM
KEY2
ILB
DSENS
RESET
DFLED
DIM
ILG
PUSHSW
CN2602
SWDVDD
REM2
KEY2
ILM+B
DSENS
RESET
DFLED
DIM
ILMGND
PUSHSW
KEYGND
J

3.4 RELAY UNIT AND ENCODER UNIT

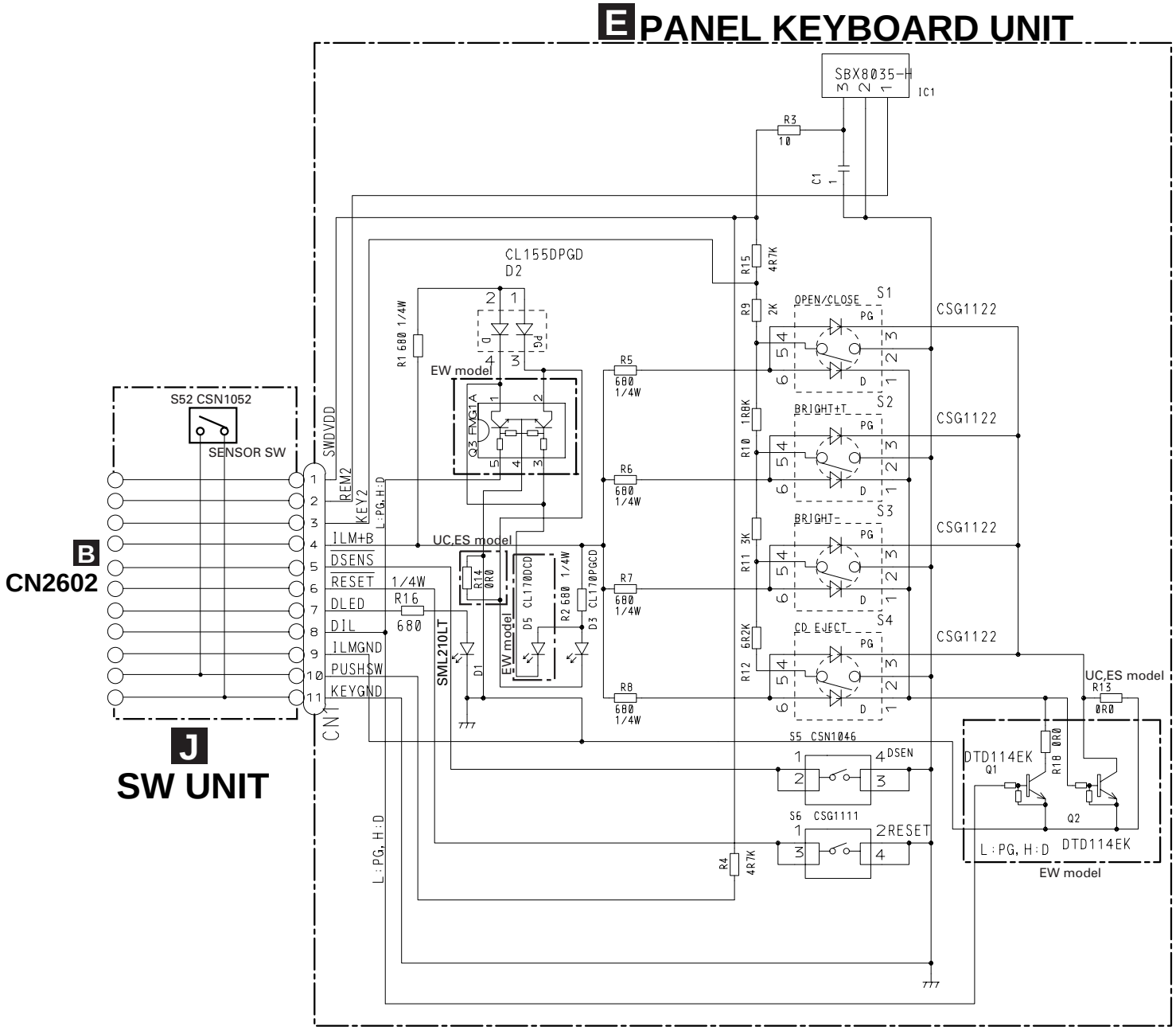



D LCD KEYBOARD UNIT
CN21
SWDVDD 12
OE 11
DATA 10
CLOCK 9
LCK 8
KEY1 7
LIM+B 6
NC 5
DIL 4
LSENS 3
KEYGND 2
ILMGND 1
CN55
L51
L52
L53
L54
L55
56
L65
L66
L63
L64
LCD MODULE
30 NC
29 MODE3
28 MODE2
27 MODE1
26 VSW
25 TINT
24 COLOR
23 DIM
22 BRT
21 U/D
20 L/R
19 VDD
18 VSS
17 N/P
16 SSW
15 VSS
14 NC
13 NC
12 NC
11 BLK(NC)
10 VSY
9 HSY
8 VSS
7 B
6 G
5 R
4 SYNC
3 VSS
2 NC
1 VIDEO
6 VID-VCC
5 VID-GND
4 VBL-GND
3 VBL-GND
2 VBL-VCC
1 VBL-VCC

3.5 LCD KEYBOARD UNIT

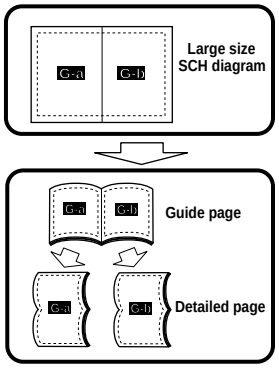


3.6 PANEL KEYBOARD UNIT



G-a

3.7 CD MECHANISM MODULE(GUIDE PAGE)



PICKUP UNIT
(SERVICE)

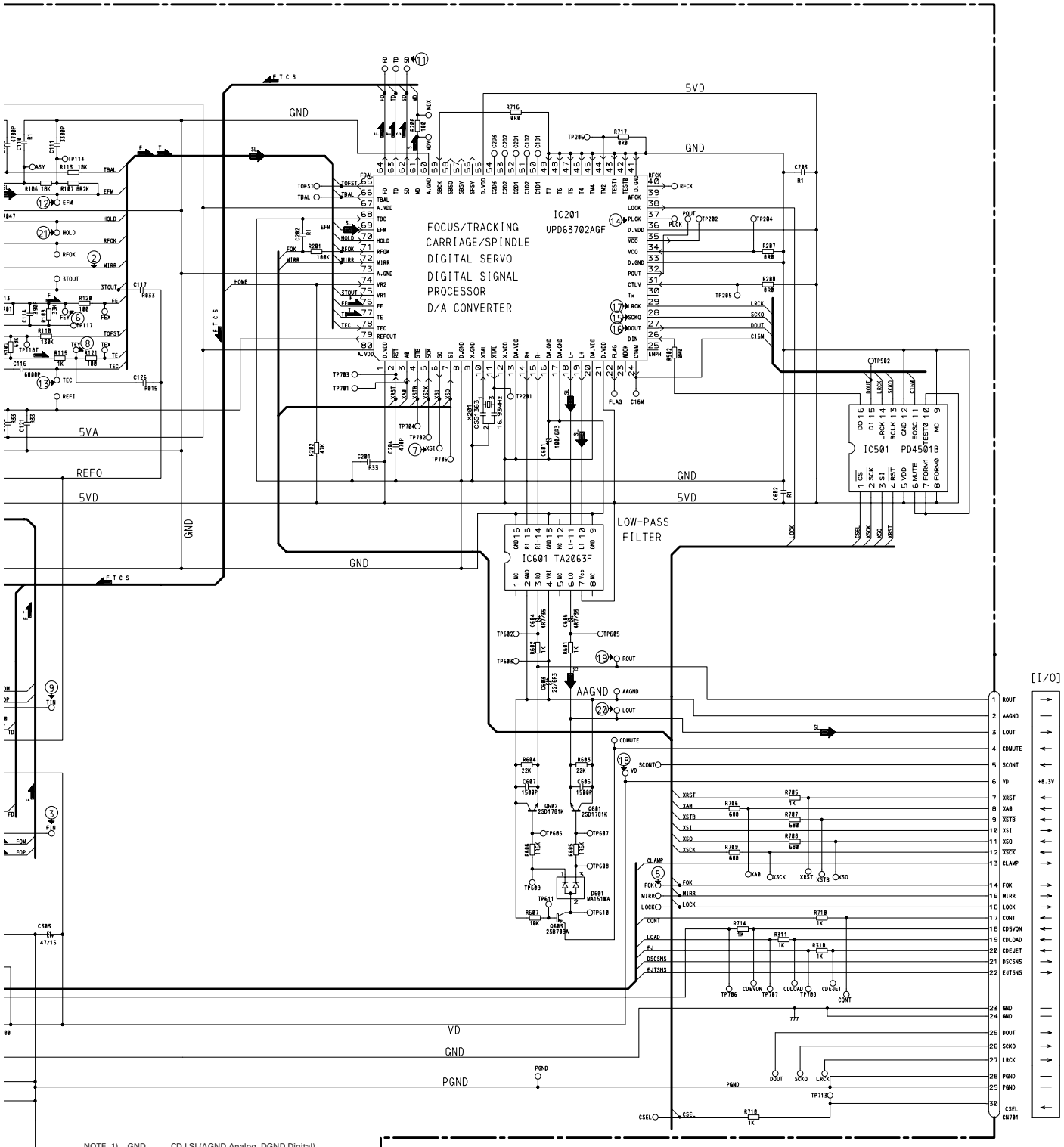
H MECHANISM FPC UNIT

I PHOTO FPC UNIT

SL SIGNAL LINE
F FOCUS SERVO LINE
T TRACKING SERVO LINE
C CARRIAGE SERVO LINE
S SPINDLE SERVO LINE

G-b

G CONTROL UNIT



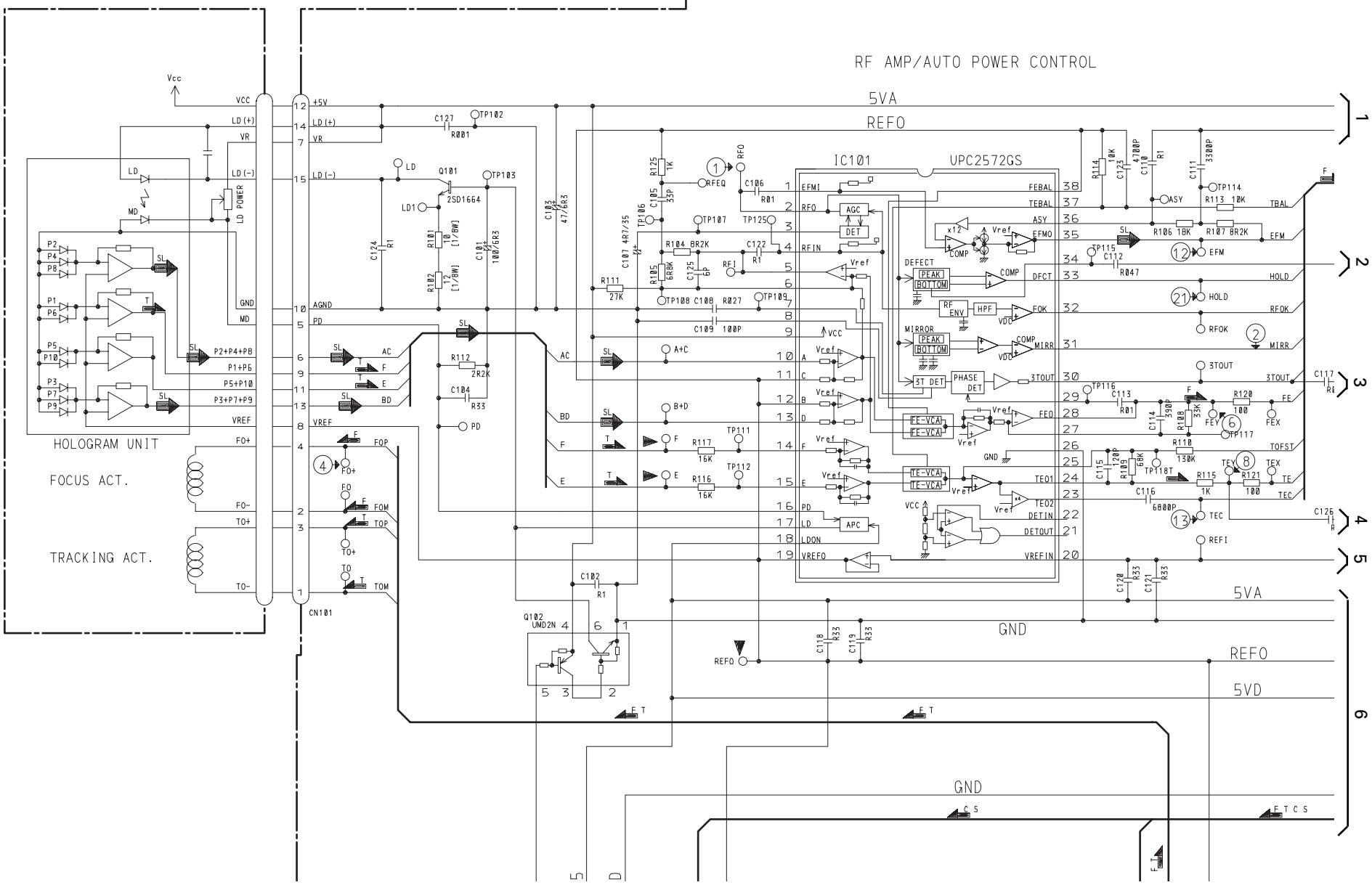
NOTE 1) GND . . . CD LSI (AGND Analog, DGND Digital)
PGND . . . Actuator, Motor Driver
AAGND . . . Audio
These GND's are not connected to each other on PCB, though they use same symbols in this schematic.
PGND is connected to a chassis by a screw.

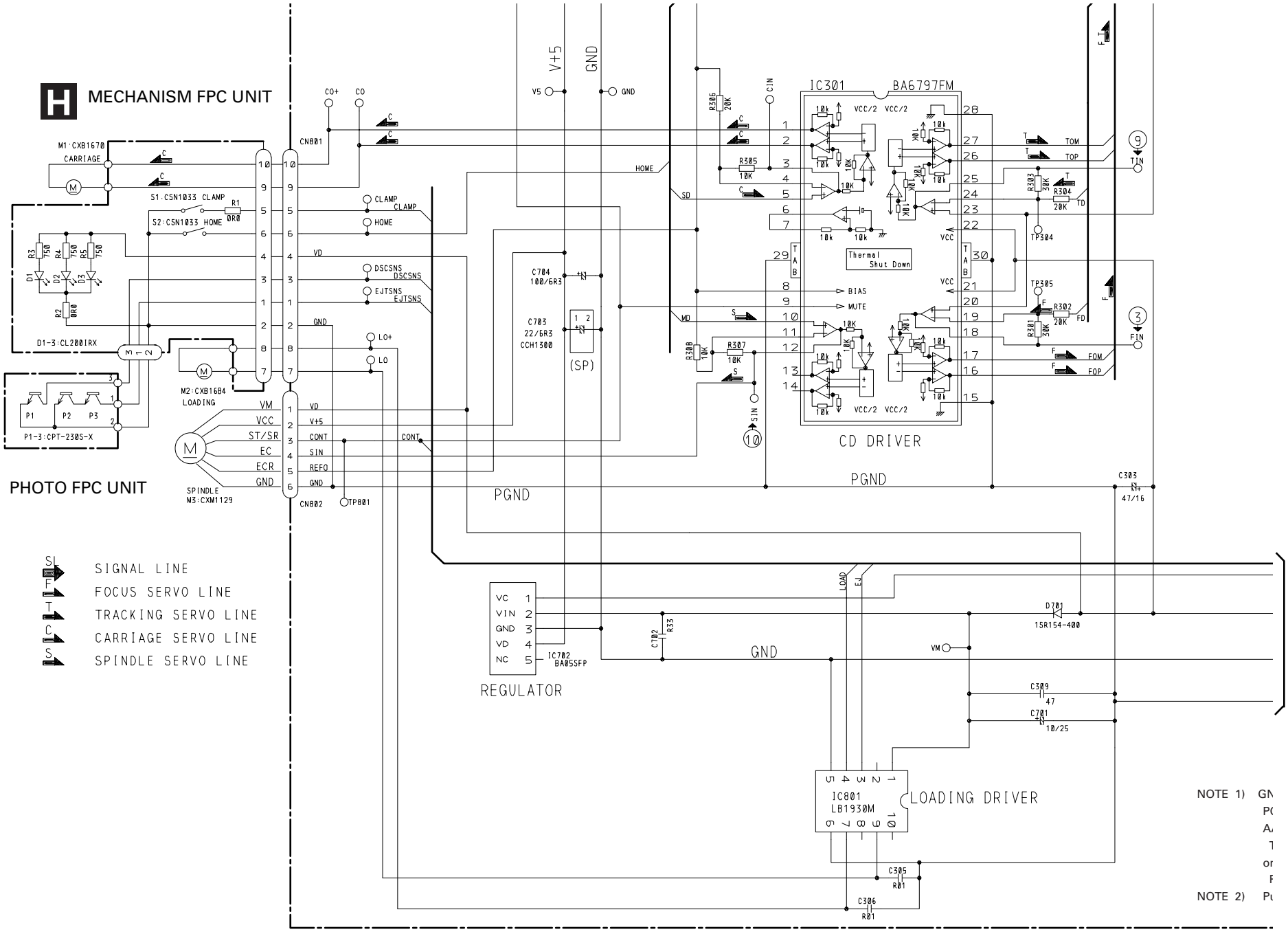
NOTE 2) Pull-up resistors of EJTSNS, DSCSNS should be 47kΩ.

G-a

PICKUP UNIT
(SERVICE)

G CONTROL UNIT





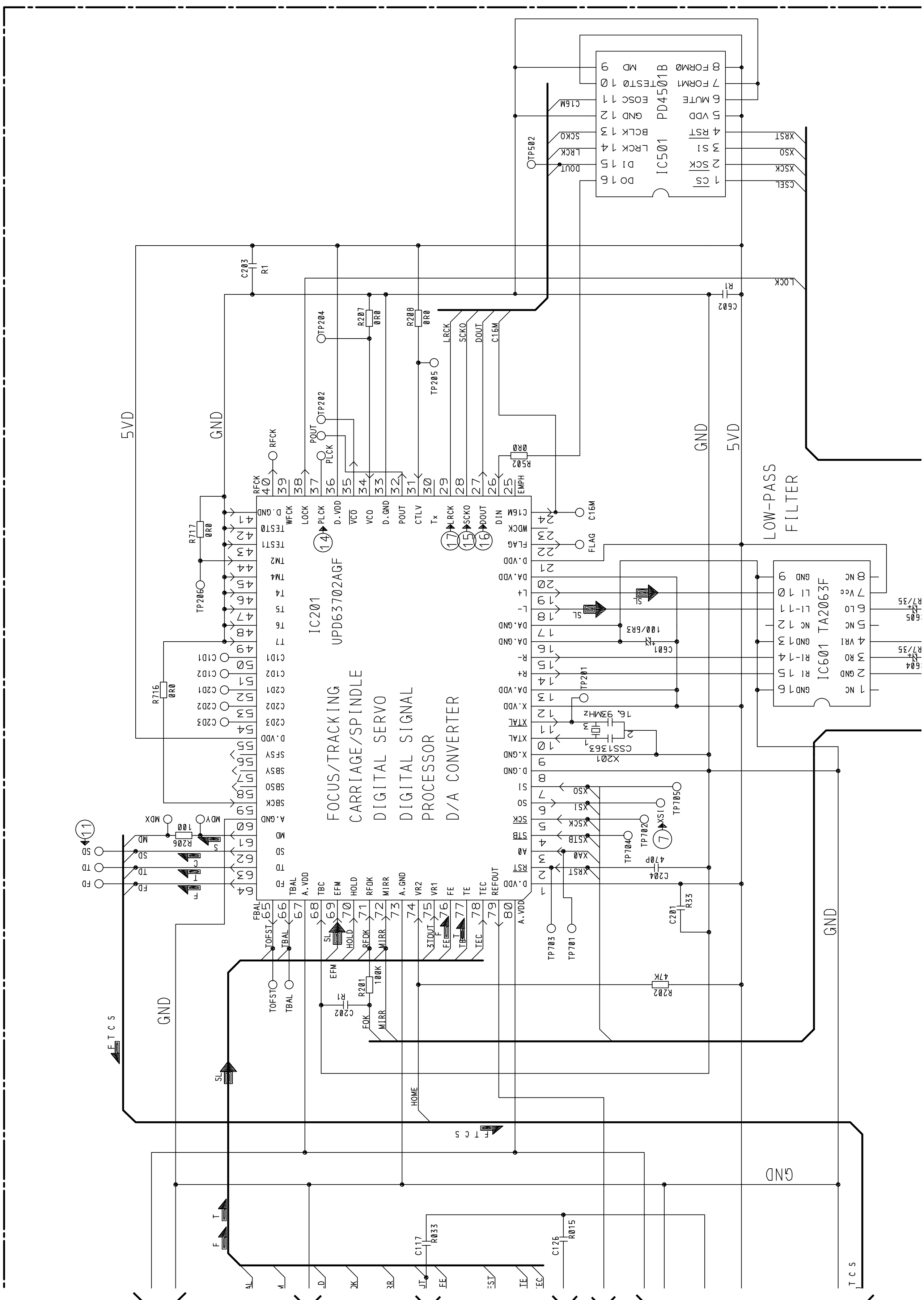
G-a G-b

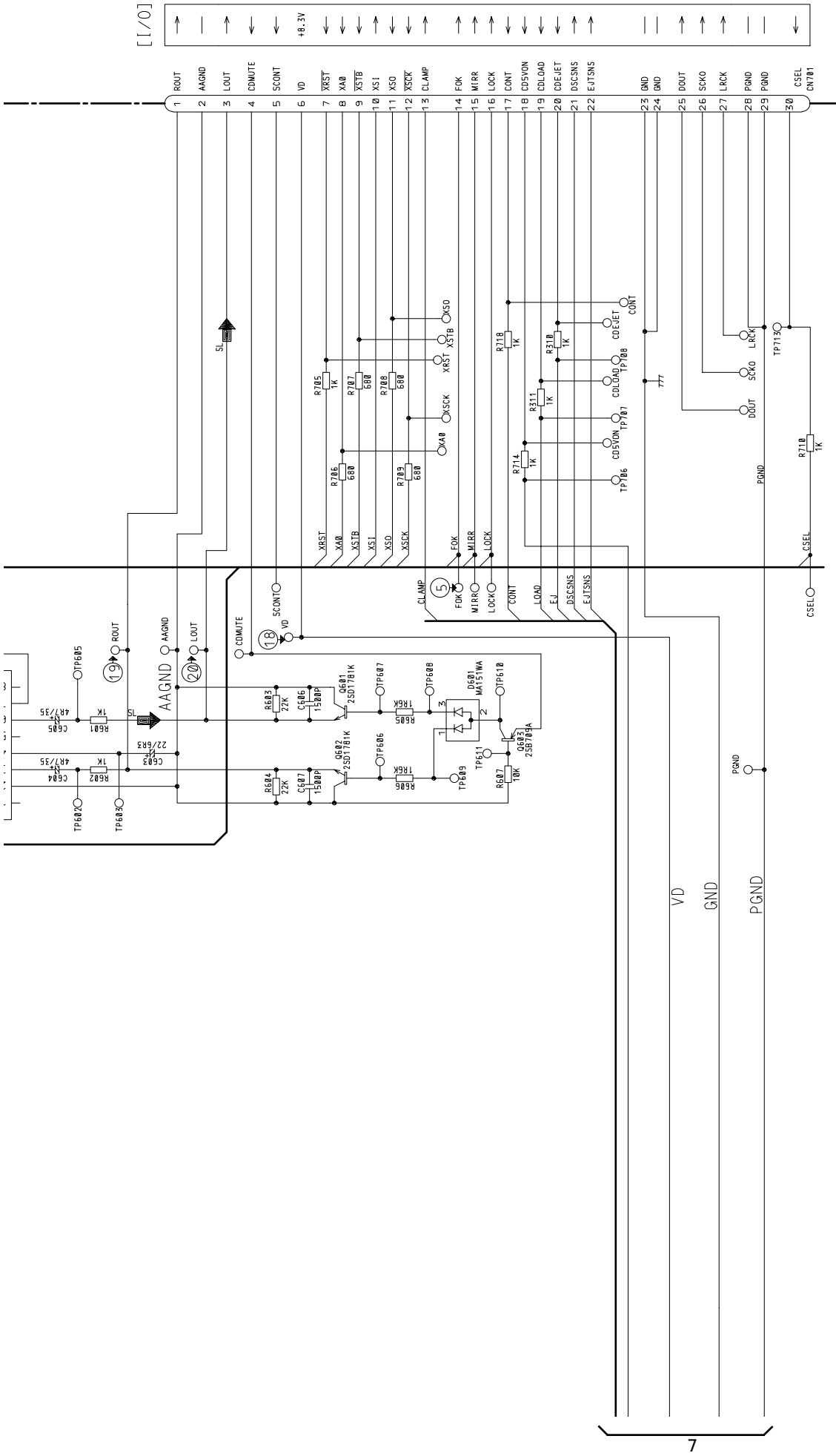
AVX-P7000CD

25

G-b
G-a

A
B
C
D


IC201
UPD63702AGF
FOCUS/TRACKING
CARRIAGE/SPINDLE
DIGITAL SERVO
DIGITAL SIGNAL
PROCESSOR
D/A CONVERTER
IC501
PD4501B
IC601 TA2063F
LOW-PASS
FILTER
5VD
GND
X201
CSS1363
16.93MHz
1
2
3
4
5
6



G-a G-b

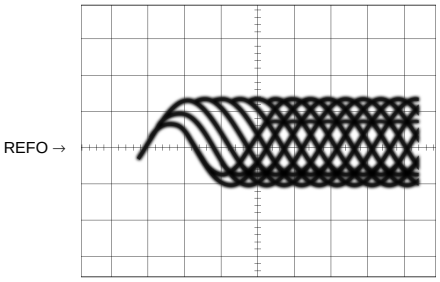
E 1) GND . . . CD LSI (AGND Analog, DGND Digital)
PGND . . . Actuator, Motor Driver
AAGND . . . Audio
These GND's are not connected to each other on PCB, though they use same symbols in this schematic. PGND is connected to a chassis by a screw.

E 2) Pull-up resistors of EJTSNS, DSCSNS should be 47kΩ.

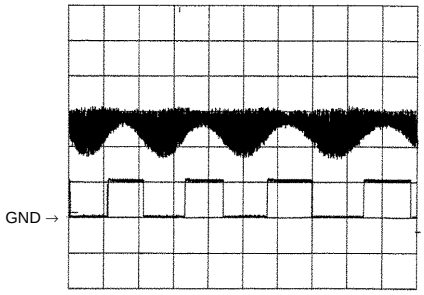
Note:1. The encircled numbers denote measuring pointes in the circuit diagram.
2. Reference voltage
REFO:2.5V

● Waveforms

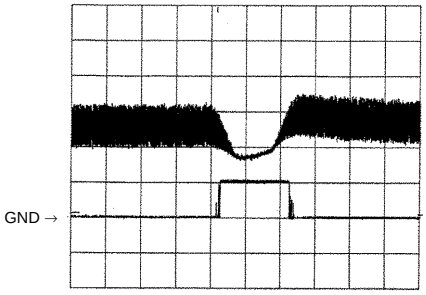
① RFO 0.5V/div. 0.5µs/div.
Normal mode: play



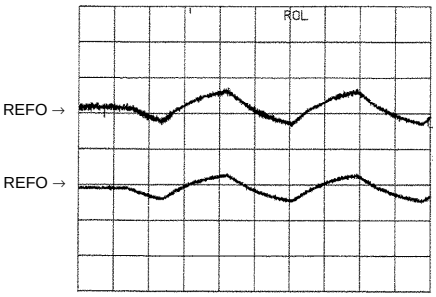
① CH1: RFO 1V/div. 0.5ms/div.
② CH2: MIRR 5V/div.
Test mode: Tracking open



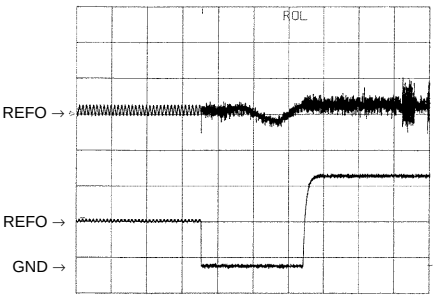
① CH1: RFO 1V/div. 0.5ms/div.
② CH2: MIRR 5V/div.
Normal mode: The defect part passes 800µm



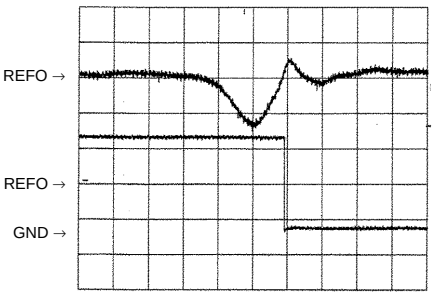
③ CH1: FIN 0.5V/div. 0.2s/div.
④ CH2: FO+ 2V/div.
Test mode: No disc, Focus close



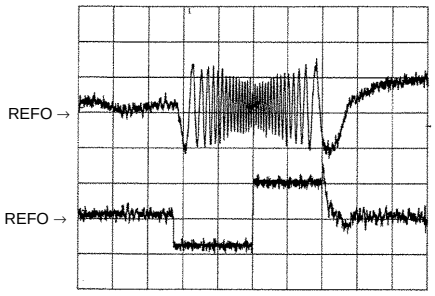
③ CH1: FIN 0.5V/div. 0.2s/div.
⑤ CH2: FOK 2V/div.
Normal mode: Focus close



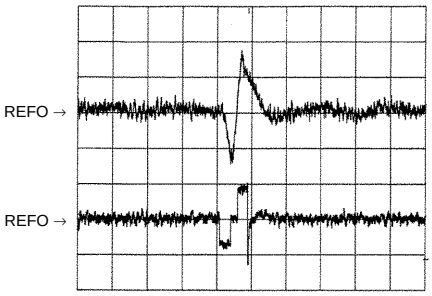
⑥ CH1: FEY 0.5V/div. 1ms/div.
⑦ CH2: XSI 2V/div.
Normal mode: Focus close



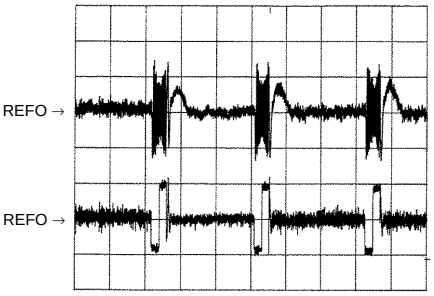
⑧ CH1: TEY 0.5V/div. 0.5ms/div.
⑨ CH2: TIN 0.5V/div.
Test mode: 32 tracks jump (FWD)



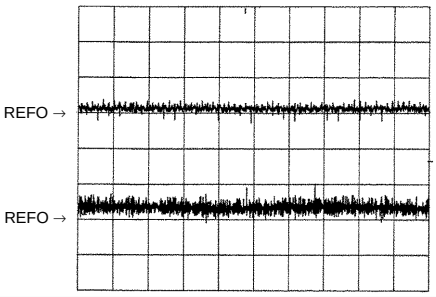
⑧ CH1: TEY 0.5V/div. 0.5ms/div.
⑨ CH2: TIN 0.5V/div.
Test mode: Single jump (FWD)



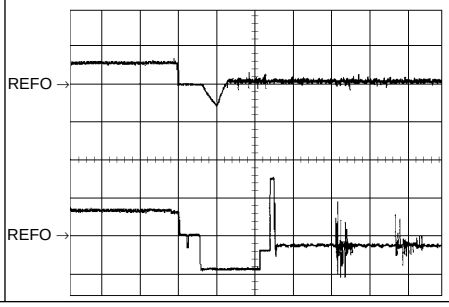
⑧ CH1: TEY 0.5V/div. 5ms/div.
⑨ CH2: TIN 0.5V/div.
Test mode: 100 tracks jump (FWD)



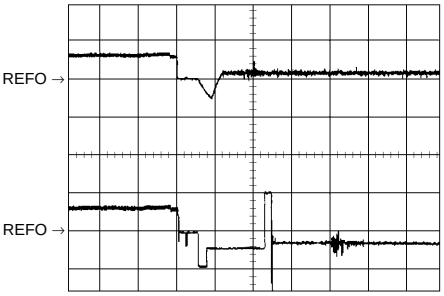
⑥ CH1: FEY 0.1V/div. 20ms/div.
③ CH2: FIN 0.2V/div.
Normal mode: Play



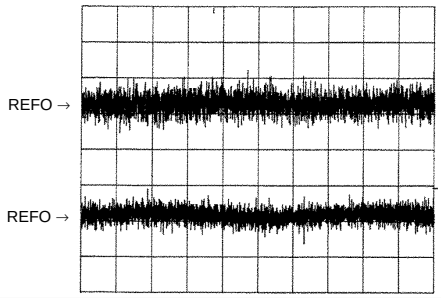
③ CH1: FIN 0.5V/div. 0.5s/div.
⑩ CH2: SIN 1V/div.
Normal mode: Focus close (12cm)



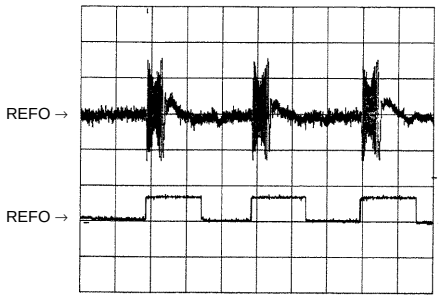
③ CH1: FIN 0.5V/div. 0.5s/div.
⑩ CH2: SIN 1V/div.
Normal mode: Focus close (8cm)



⑧ CH1: TEY 0.2V/div.
⑨ CH2: TIN 0.2V/div. 20ms/div.
Normal mode: play

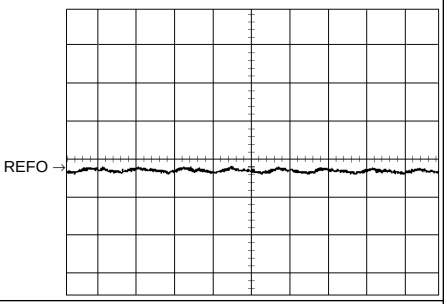


⑧ CH1: TEY 0.5V/div.
⑪ CH2: SD 0.5V/div. 5ms/div.



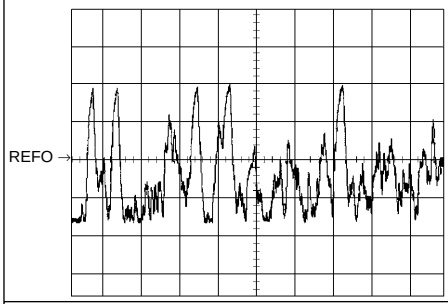
⑩ SIN 0.5V/div. 0.1s/div.

Normal mode: Play (12cm)



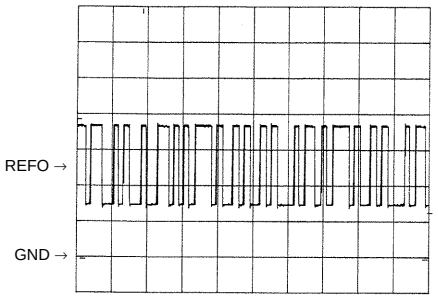
⑩ SIN 1V/div. 10ms/div.

Long Search (12cm)

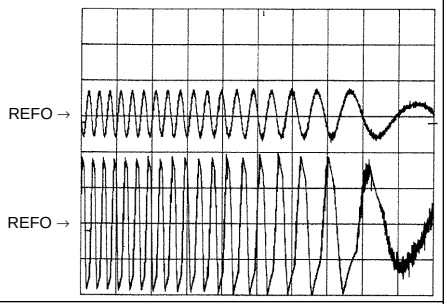


⑫ EFM 1V/div. 5µs/div.

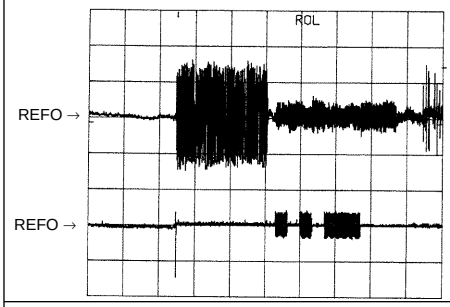
Play



⑧ CH1: TEY 1V/div.
⑬ CH2: TEC 1V/div. 2ms/div.
Test mode: Focus close
Tracking open

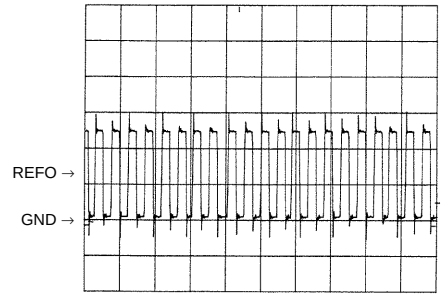


⑧ CH1: TEY 0.5V/div.
⑥ CH2: FEY 0.5V/div. 0.2s/div.
Normal mode: AGC after focus close



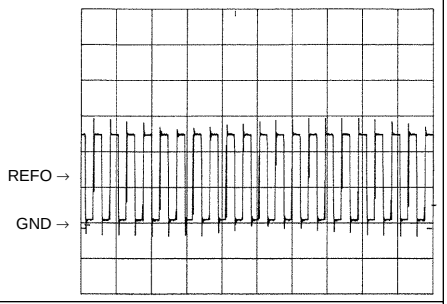
⑭ PLCK 2V/div. 0.5µs/div.

Play



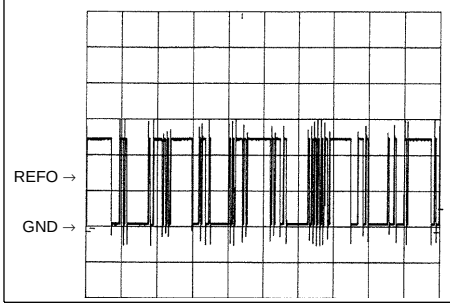
⑮ SCKO 2V/div. 1µs/div.

Play

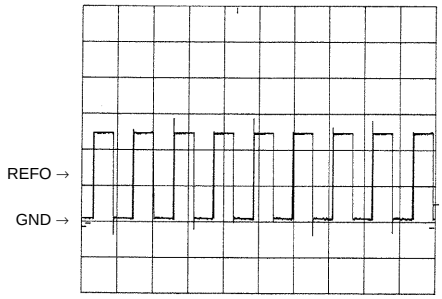


⑯ Dout 2V/div. 10µs/div.

Play

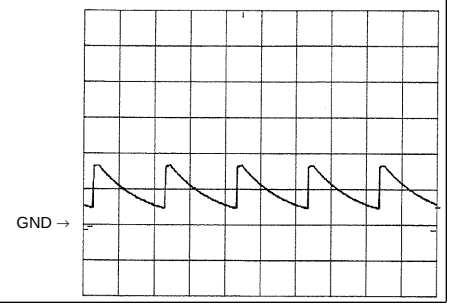


⑰ LRCK 2V/div. 20µs/div.

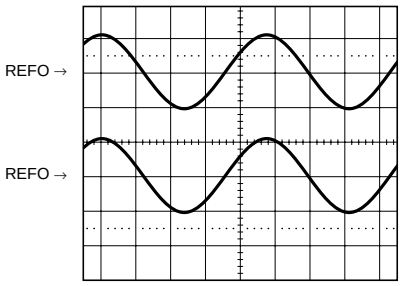


⑱ VD 5V/div. 50ms/div.

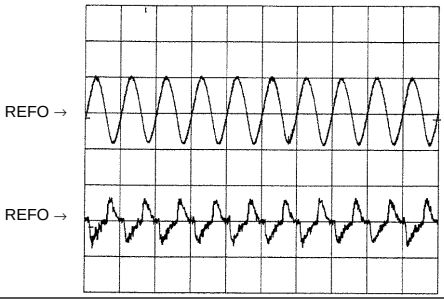
Normal mode: No disc



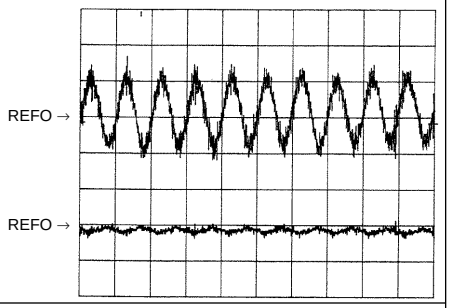
⑲ CH1: R OUT 1V/div. 0.2ms/div.
⑳ CH2: L OUT 1V/div.
Normal mode: Play (1kHz 0dB)



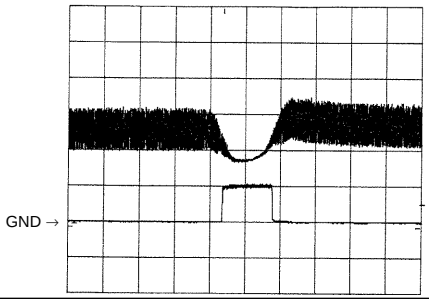
⑥ CH1: FEY 0.2V/div. 1ms/div.
③ CH2: FIN 0.5V/div.
Normal mode: During AGC



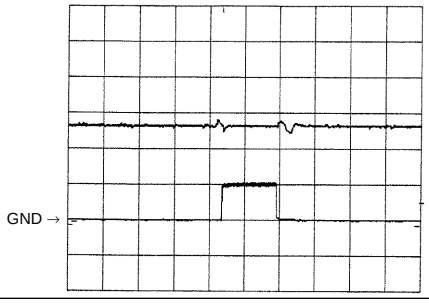
⑧ CH1: TEY 0.2V/div. 1ms/div.
⑨ CH2: TIN 0.5V/div.
Normal mode: During AGC



① CH1: RFO 1V/div. 0.5ms/div.
㉑ CH2: HOLD 5V/div.
Normal mode: The defect part passes 800µm

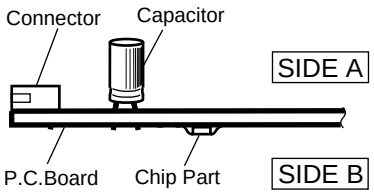


③ CH1: FIN 1V/div. 0.5ms/div.
㉑ CH2: HOLD 5V/div.
Normal mode: The defect part passes 800µm

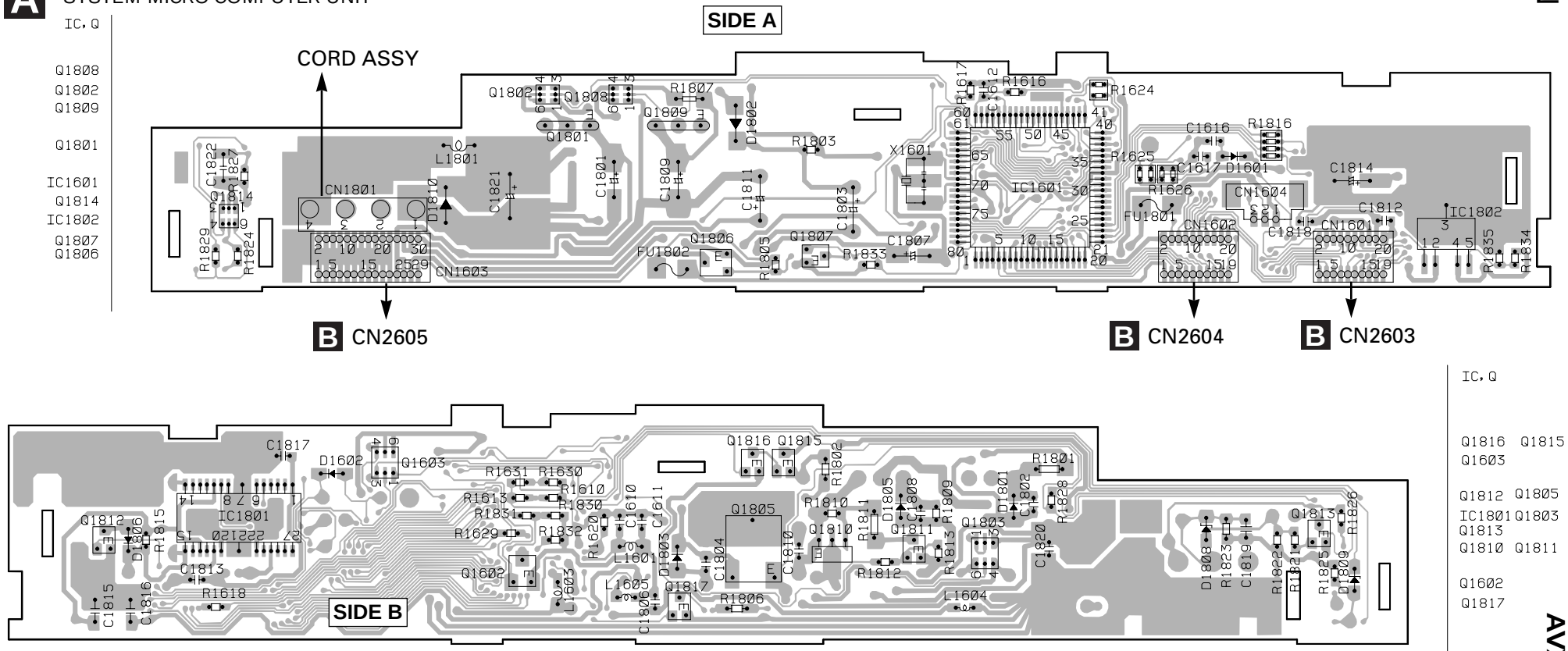


NOTE FOR PCB DIAGRAMS

1. The parts mounted on this PCB include all necessary parts for several destination.
   For further information for respective destinations, be sure to check with the schematic diagram.
2. Viewpoint of PCB diagrams

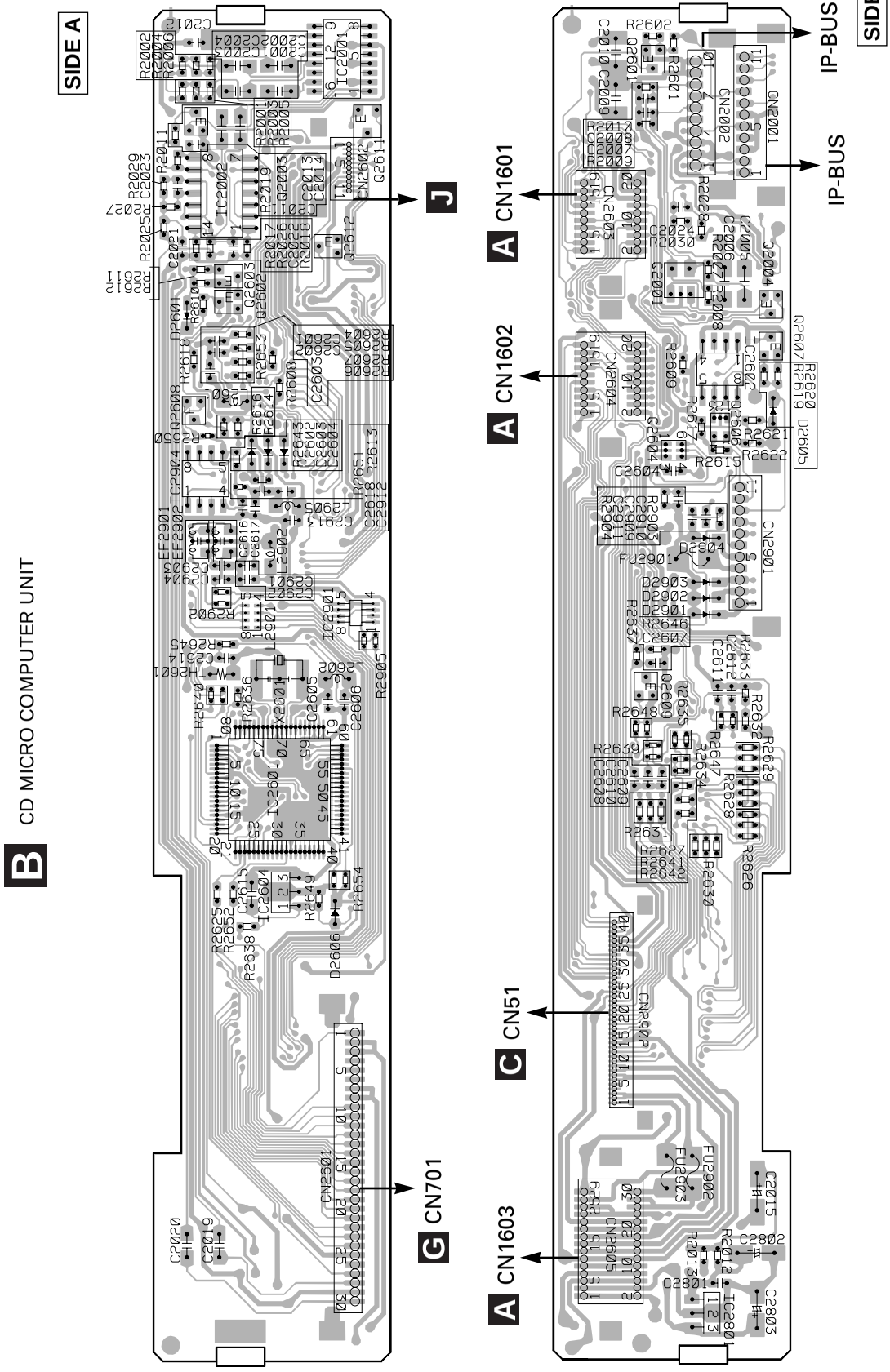


A SYSTEM MICRO COMPUTER UNIT



A SYSTEM MICRO COMPUTER UNIT

4.2 CD MICRO COMPUTER UNIT



IC, Q

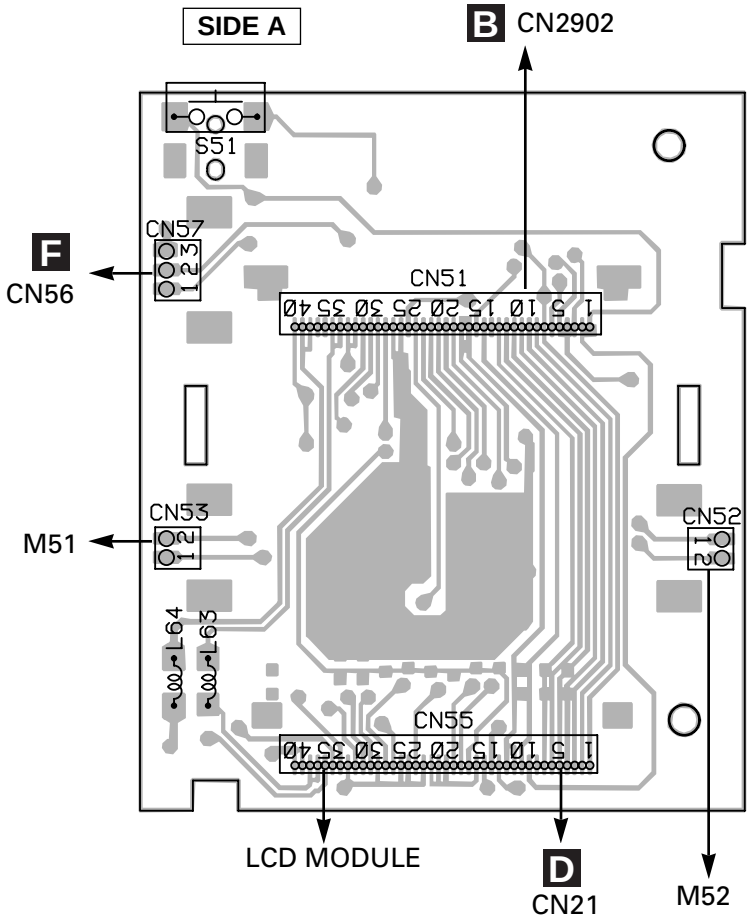
IC2904 Q2608 IC2602 IC2002 Q2603 IC2601 Q2602 IC2604 Q2003 IC2901 IC2001 Q2612 Q2611

IC, Q

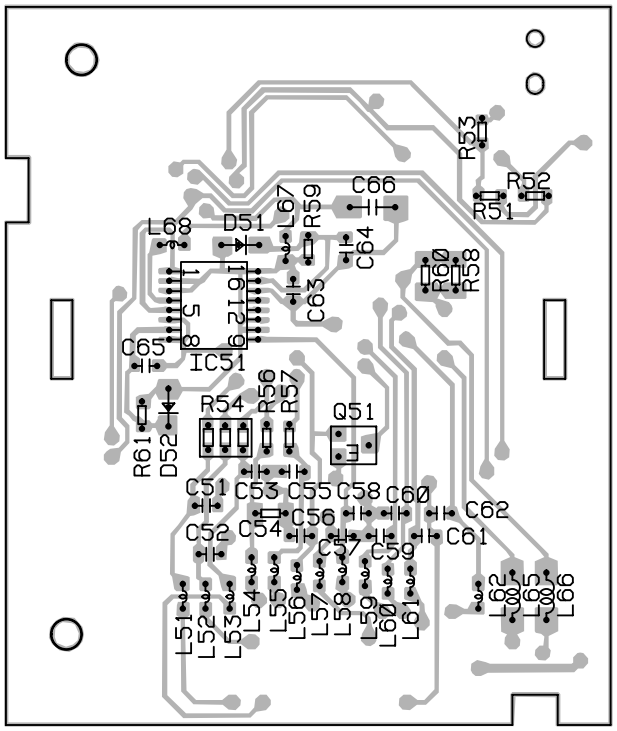
Q2601 Q2001 Q2604 Q2609 Q2606 IC2801 Q2607 Q2004

4.3 RELAY UNIT

C RELAY UNIT

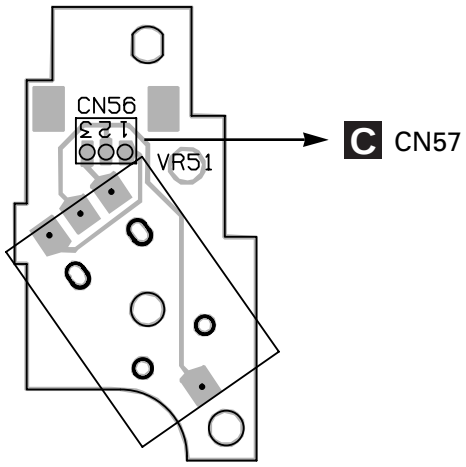


C RELAY UNIT SIDE B

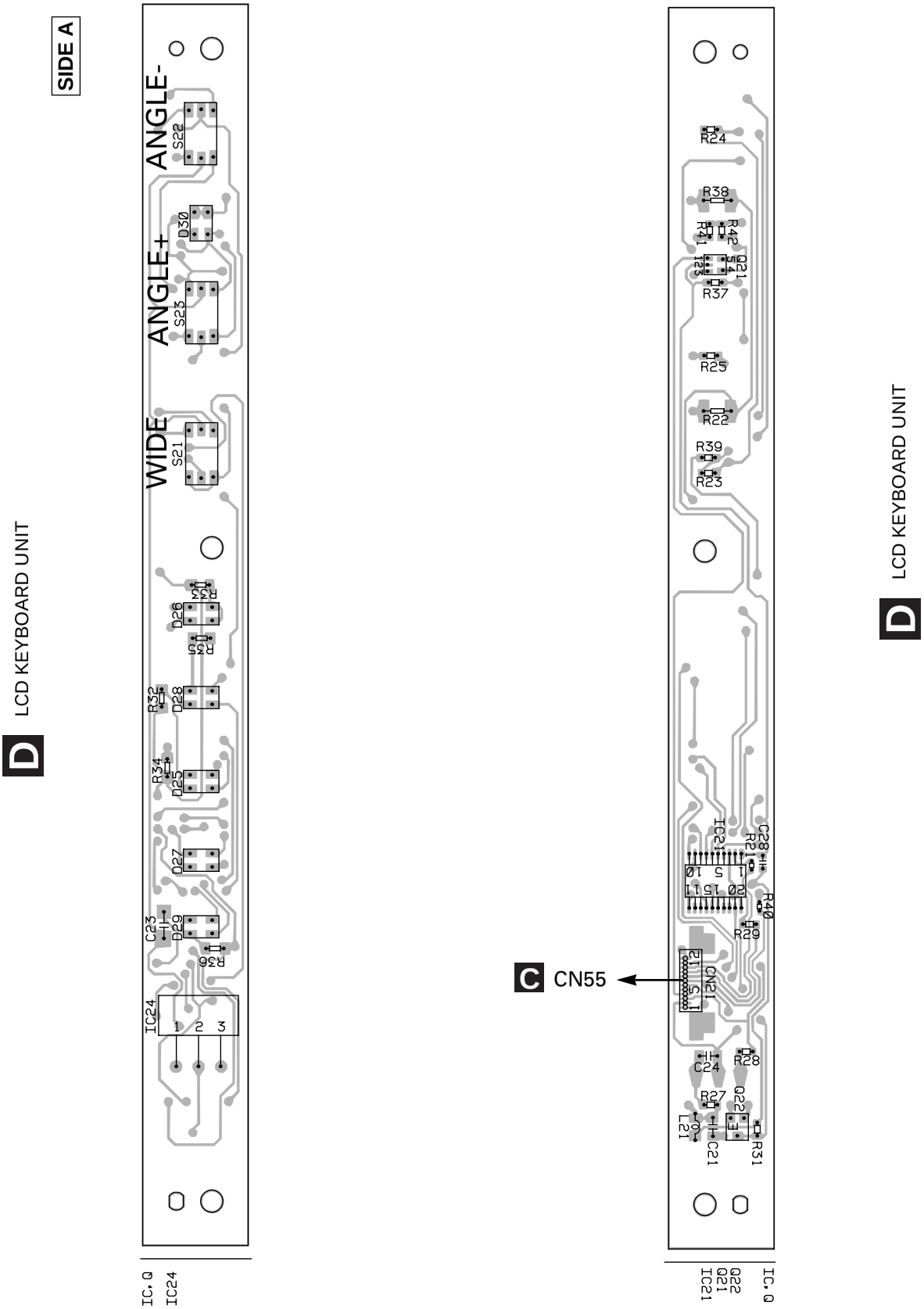


4.4 ENCODER UNIT

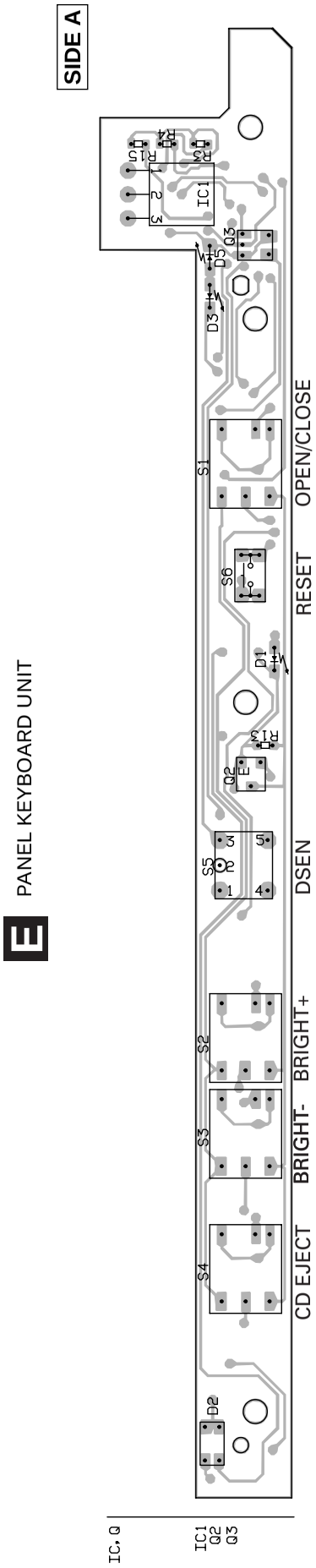
F ENCODER UNIT

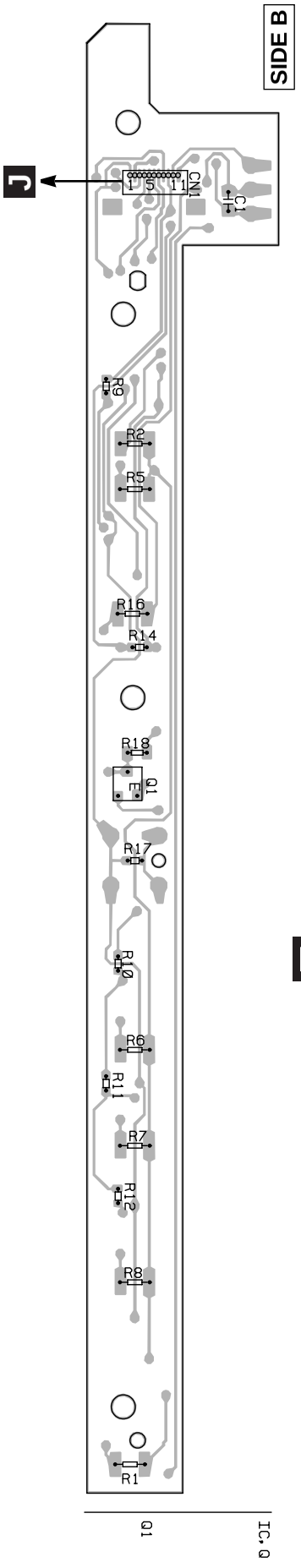


4.5 LCD KEYBOARD UNIT



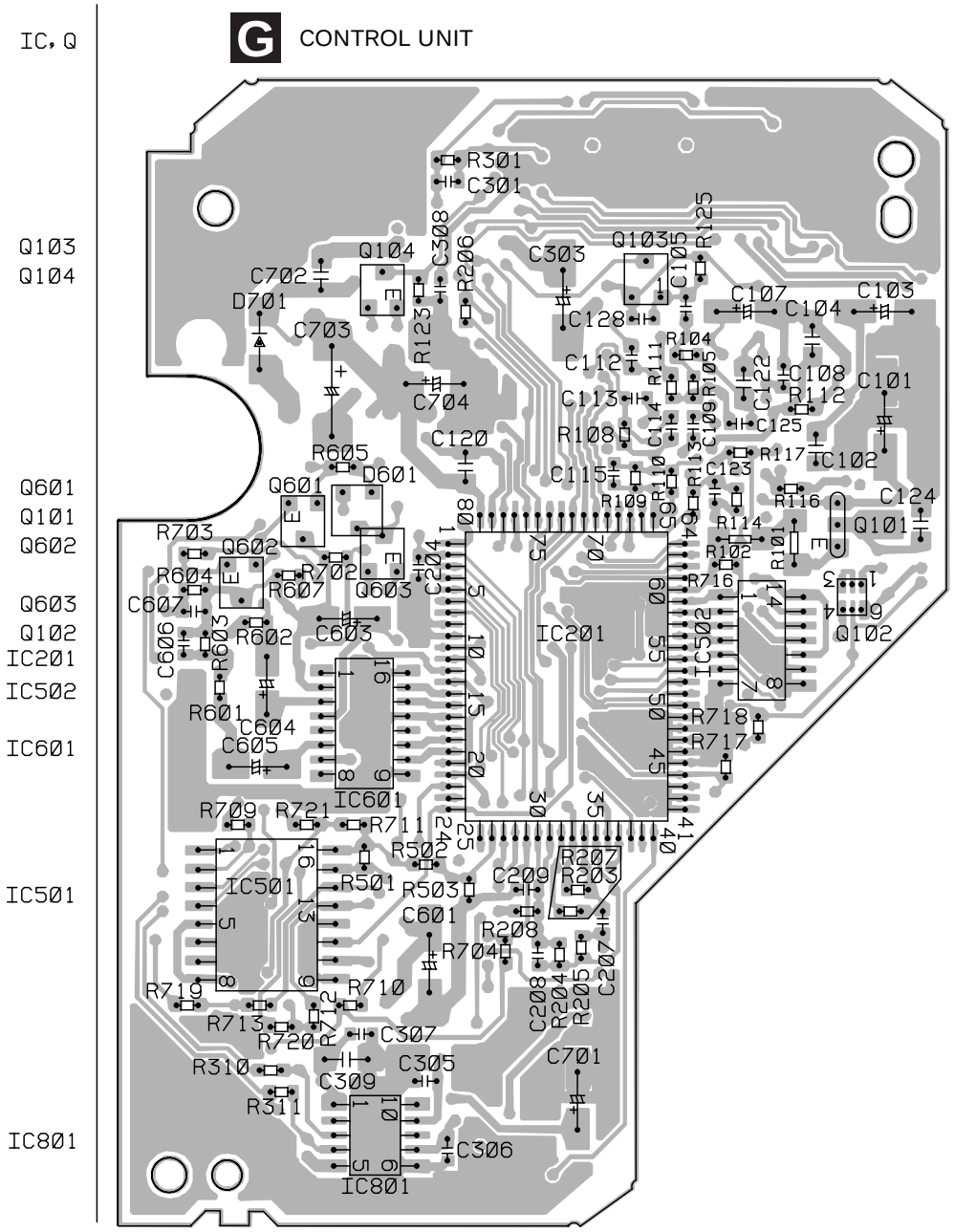
4.6 PANEL KEYBOARD UNIT



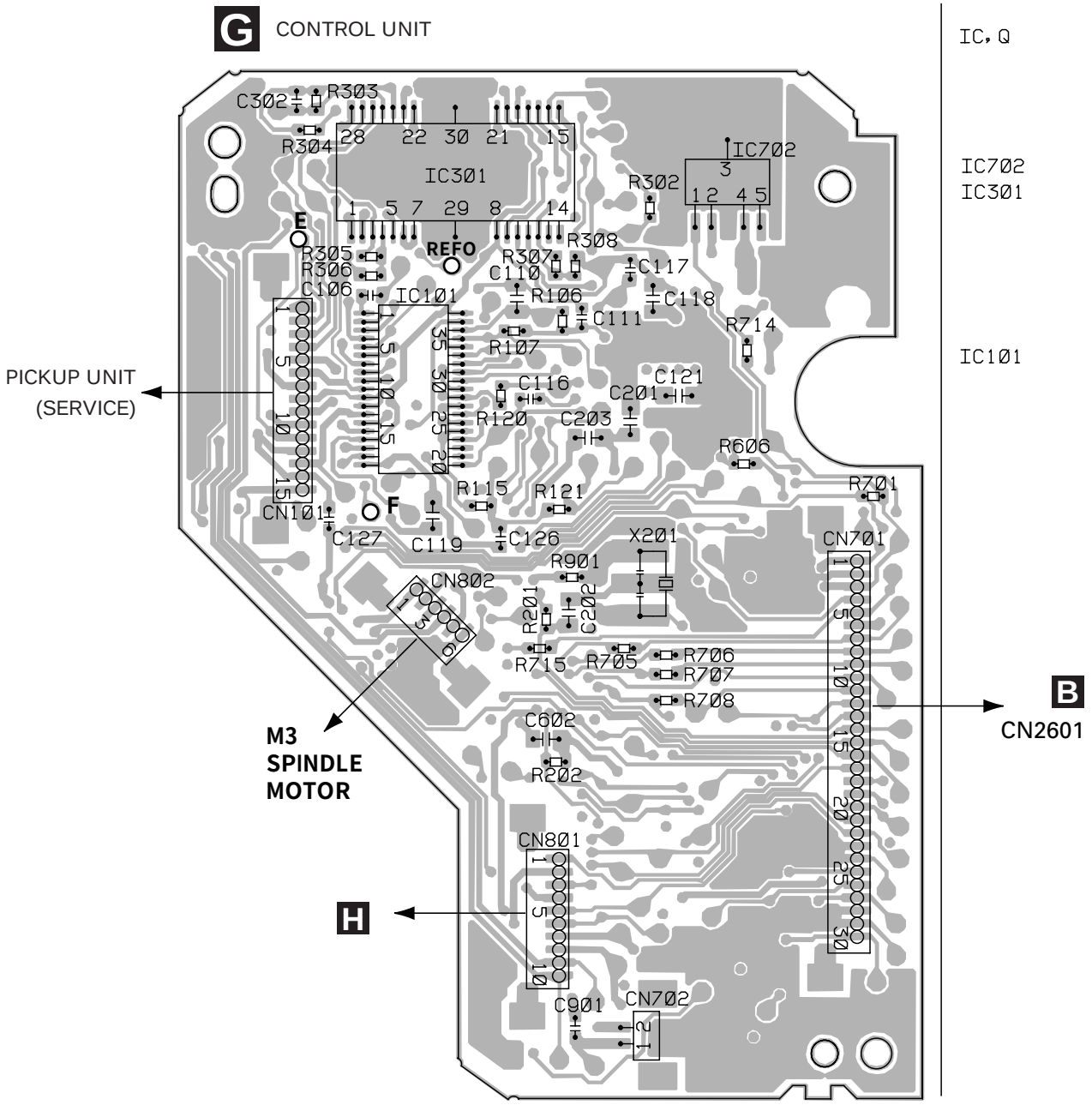


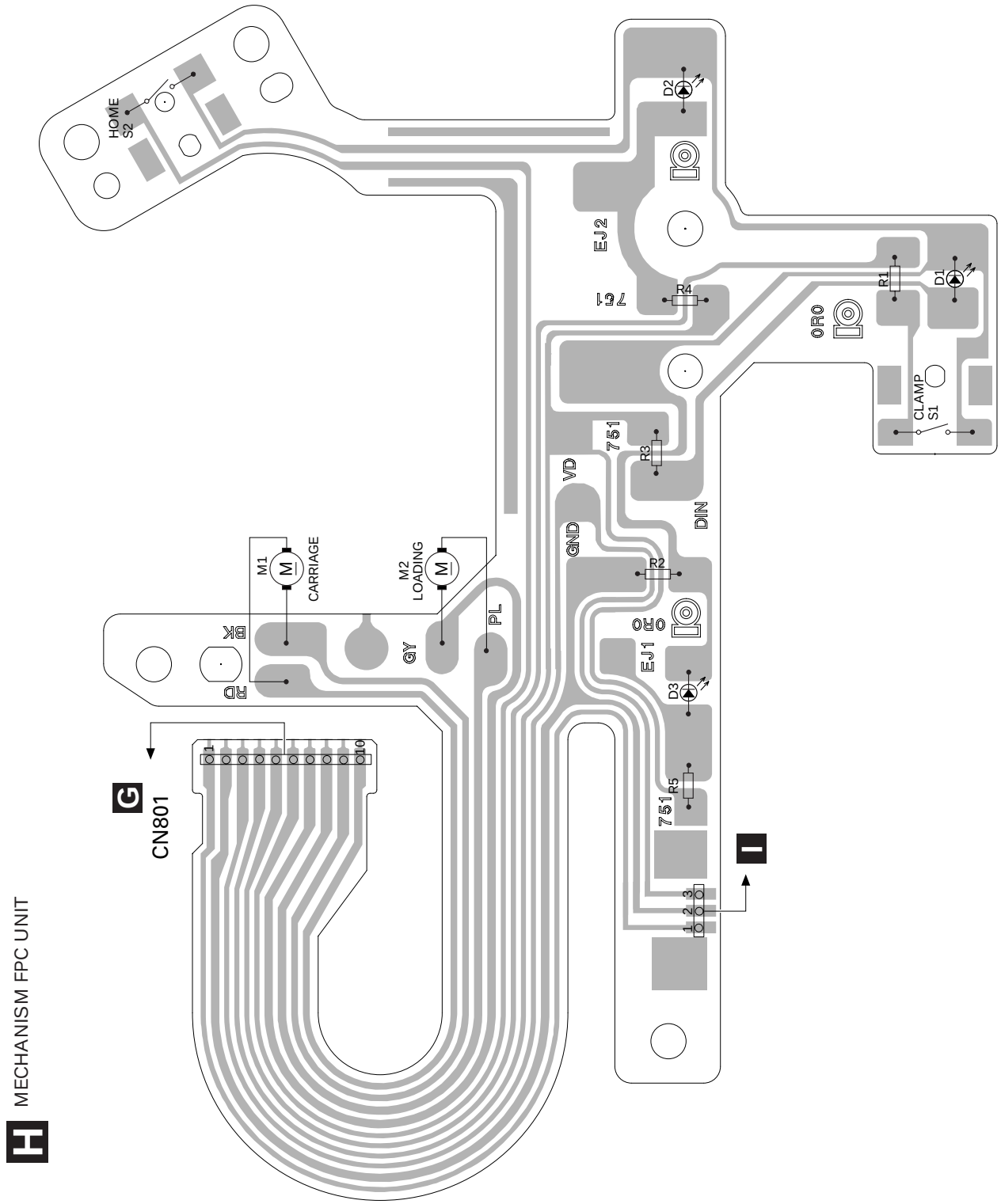
4.7 CD MECHANISM MODULE

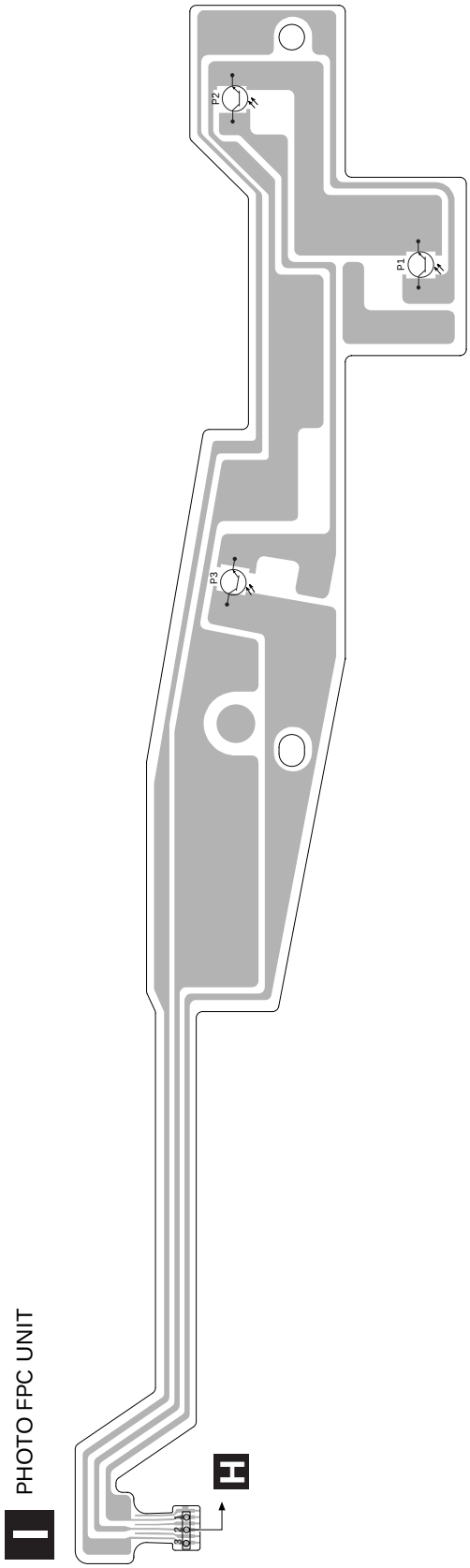
SIDE A



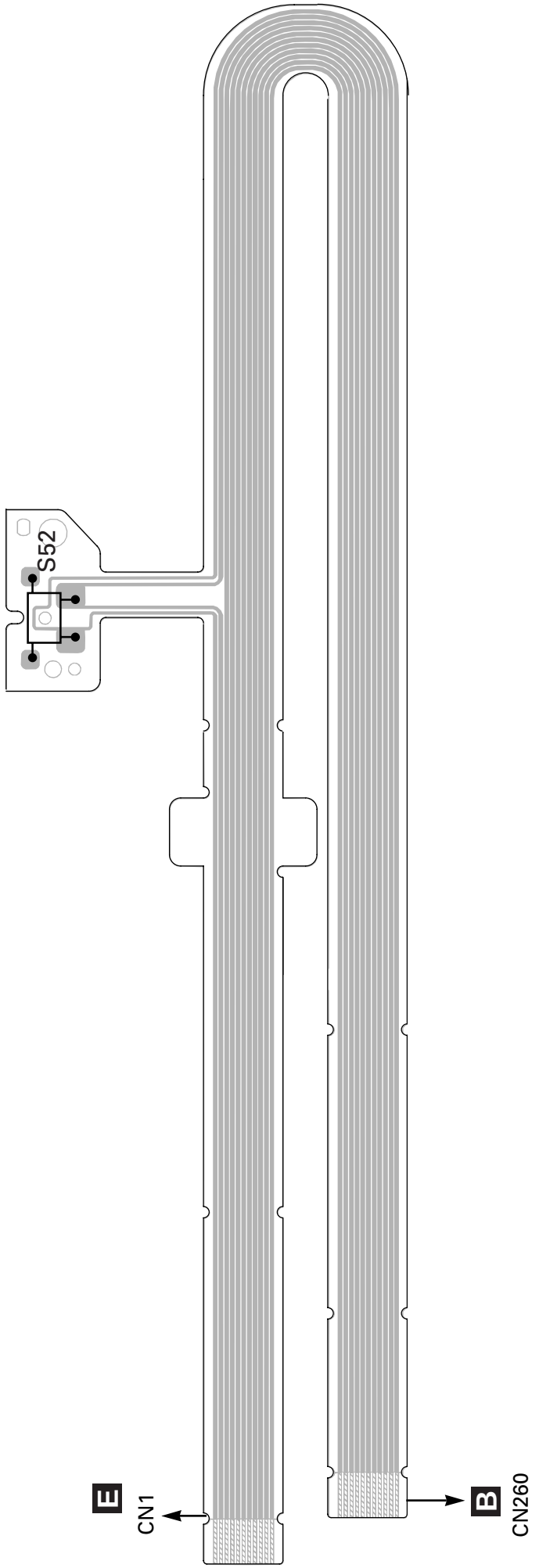
SIDE B


G CONTROL UNIT
IC, Q
IC702
IC301
IC101
PICKUP UNIT
(SERVICE)
M3
SPINDLE
MOTOR
B
CN2601
H
E
F
REFO
IC301
IC702
IC101
CN101
CN701
CN802
CN801
CN702
X201
C901
R303
R304
R302
R305
R306
C106
R308
R307
C110
C117
R106
C111
C118
R714
R107
C116
C121
C201
R120
C203
R606
R115
R121
R701
C127
C119
C126
R901
R201
C202
R715
R705
R706
R707
R708
C602
R202


HOME
S2
D2
EJ2
R4
R1
D1
0R0
CLAMP
S1
751
R3
VD
GND
DIN
M1
CARRIAGE
M2
LOADING
R2
BK
GY
PL
RD
EJ1
0R0
D3
R5
751
G
CN801
I
H
MECHANISM FPC UNIT


P2
P1
P3
PHOTO FPC UNIT
1
5
CN203

4.8 SW UNIT



5. ELECTRICAL PARTS LIST

NOTE:

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

Chip Resistor

RS1/○S○○○J,RS1/○○S○○○J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

C Unit Number : CWM6425
Unit Name : Relay Unit

MISCELLANEOUS

=====Circuit Symbol and No.		===Part Name	Part No.
IC	51	IC	TC74VHC123AFT
Q	51	Transistor	DTC124EU
D	51	Diode	MA110
D	52	Diode	MA110
L	51	Inductor	CTF1379
L	52	Inductor	CTF1379
L	53	Inductor	CTF1379
L	54	Inductor	CTF1379
L	55	Inductor	CTF1379
L	56	Inductor	CTF1379
L	57	Inductor	CTF1379
L	58	Inductor	CTF1379
L	59	Inductor	CTF1306
L	60	Inductor	CTF1306
L	61	Inductor	CTF1306
L	62	Inductor	CTF1379
L	63	Inductor	CTF1488
L	64	Inductor	CTF1488
L	65	Inductor	CTF1488
L	66	Inductor	CTF1488
L	67	Inductor	CTF1379
L	68	Inductor	CTF1379
S	51	Spring Switch(Back sensor SW)	CSN1033

RESISTORS

R	51		RS1/16S332J
R	52		RS1/16S102J
R	53		RS1/16S473J
R	54		RA3C102J
R	56		RS1/16S103J
R	57		RS1/16S102J
R	58		RS1/10S102J
R	59		RS1/16S822J
R	60		RS1/10S102J
R	61		RS1/16S822J

CAPACITORS

C	51		CCSRCH220J50
C	52		CCSRCH220J50
C	53		CCSRCH220J50
C	54		CKSQYB105K10
C	63		CKSRYB102K50
C	64		CKSRYB471K50
C	65		CCSRCH471J50
C	66		CKSYB475K10

A Unit Number :CWM6430(UC,ES model)
:CWM6431(EW model)
Unit Name :System Micro Computer Unit

MISCELLANEOUS

=====Circuit Symbol and No.		===Part Name	Part No.
IC	1601	IC	PE5038A
IC	1801	IC	BA6247FP
IC	1802	IC	BA00ASFP
Q	1602	Transistor	DTB122JK
Q	1603	Transistor	IMX2
Q	1801	Transistor	2SD2396
Q	1802	Transistor	UMD12N
Q	1803	Transistor	IMD3A
Q	1805	Transistor	2SD1760F5
Q	1806	Transistor	2SA1036K
Q	1807	Transistor	2SC4081
Q	1808	Transistor	UMD12N
Q	1809	Transistor	2SD2396
Q	1810	Transistor	2SA1797
Q	1811	Transistor	2SC4081
Q	1812	Transistor	DTC124EU
Q	1814	Transistor	UMX2N
Q	1815	Transistor	DTA114EU
Q	1816	Transistor	DTC124EU
D	1601	Diode	MA8027(H)
D	1602	Diode	MA8027(H)
D	1801	Diode	MA8091(L)
D	1802	Diode	SC016-2
D	1803	Diode	UDZS5R6(B)
D	1805	Diode	UDZS10(B)
D	1806	Diode	MA8068(M)
D	1809	Diode	MA8075(H)
D	1810	Diode	SC016-2
L	1601	Inductor	CTF1399
L	1603	Inductor	CTF1399
L	1604	Inductor	CTF1399
L	1605	Inductor	CTF1399
L	1801	Inductor	CTF1487
FU	1801	Micro-Fuse 2A	CEK1190
FU	1802	Micro-Fuse 400mA	CEK1184
X	1601	Radiator 6.290MHz	CSS1451

RESISTORS

R	1610		RS1/16S473J
R	1616		RS1/16S102J
R	1618		RS1/16S102J
R	1620		RS1/16S473J
R	1624		RA2CQ473J
R	1625		RA2CQ223J
R	1626		RA2CQ473J
R	1629		RS1/16S103J
R	1630	(UC,ES model)	RS1/16S473J
R	1631		RS1/16S473J

Circuit Symbol and No.	Part Name	Part No.
R 1801		RS1/4S221J
R 1802		RS1/10S911J
R 1803		RS1/16S822J
R 1805		RS1/16S473J
R 1806		RS1/10S272J
R 1807		RS1/8S301J
R 1809		RS1/16S472J
R 1810		RS1/16S473J
R 1811		RS1/4S331J
R 1812		RS1/16S682J
R 1813		RS1/16S473J
R 1815		RS1/16S471J
R 1816		RA4C102J
R 1824		RS1/16S223J
R 1825		RS1/16S473J
R 1826		RS1/16S103J
R 1827		RS1/16S473J
R 1828		RS1/16S473J
R 1829		RS1/16S473J
R 1831		RS1/16S473J
R 1832		RS1/16S103J
R 1833		RS1/16S474J
R 1834		RS1/16S163J
R 1835		RS1/16S222J

CAPACITORS

C 1610		CKSRYB473K16
C 1611		CKSRYB473K16
C 1612		CKSRYB102K50
C 1616		CKSRYB104K16
C 1617		CKSRYB104K16
C 1801	100µF/16V	CCH1228
C 1802		CKSRYB473K16
C 1803		CEHAT102M16
C 1804		CKSRYB103K50
C 1806		CKSRYB103K50
C 1807		CEV220M6R3
C 1808		CKSRYB103K50
C 1809	100µF/16V	CCH1228
C 1810		CKSRYB473K16
C 1811		CEHAT102M16
C 1812		CKSRYB223K25
C 1813		CKSRYB223K25
C 1814		CEV101M10
C 1815		CKSQYB105K16
C 1816		CKSQYB105K16
C 1817		CKSRYB104K16
C 1818		CKSRYB104K16
C 1820		CKSRYB104K16
C 1821		CEHAT102M16
C 1822		CEH100M16

B Unit Number : CWM6444
Unit Name : CD Micro Computer Unit

MISCELLANEOUS

IC 2001	IC	TA2050F
IC 2002	IC	BA3129F
IC 2601	IC	PE5046B
IC 2602	IC	CA0008AM
IC 2604	IC	S-80734ANDYI
IC 2801	IC	NJM78L08UA
IC 2901	IC	TC7W34FU
IC 2904	IC	BA7071F
Q 2001	Transistor	FMG12
Q 2003	Transistor	DTC144EU

Circuit Symbol and No.	Part Name	Part No.
Q 2004	Transistor	DTA114EU
Q 2601	Transistor	2SC4081
Q 2602	Transistor	DTC114TU
Q 2603	Transistor	2SC4081
Q 2604	Transistor	UMD12N
Q 2606	Transistor	UMG1
Q 2607	Transistor	2SC4081
Q 2608	Transistor	2SC4081
Q 2609	Transistor	DTA114EU
Q 2611	Transistor	DTB123EK
Q 2612	Transistor	DTC115EUA
D 2601	Diode	MA8082(M)
D 2602	Diode	MA110
D 2603	Diode	MA110
D 2604	Diode	MA110
D 2605	Diode	MA8075(H)
D 2606	Diode	MA110
D 2901	Diode	MA8062(M)
D 2902	Diode	MA8062(M)
D 2903	Diode	MA8062(M)
D 2904	Diode	MA8062(M)
FU 2901	Micro-Fuse 2A	CEK1190
FU 2902	Micro-Fuse 2A	CEK1190
FU 2903	Micro-Fuse 1A	CEK1191
EF 2901		CCG1067
EF 2902		CCG1067
L 2601	Inductor	LCTB2R2K2125
L 2602	Inductor	CTF1399
L 2901		CTF1421
L 2902	Inductor	LCTB2R2K2125
L 2905	Inductor	LCTB2R2K2125
X 2601	Radiator 4.19MHz	CSS1436

RESISTORS

R 2001	RS1/16S181J
R 2002	RS1/16S181J
R 2003	RS1/16S223J
R 2004	RS1/16S223J
R 2005	RS1/16S102J
R 2006	RS1/16S102J
R 2007	RS1/16S821J
R 2008	RS1/16S821J
R 2009	RS1/16S223J
R 2010	RS1/16S223J
R 2011	RS1/16S104J
R 2012	RS1/16S103J
R 2013	RS1/16S103J
R 2017	RS1/16S104J
R 2018	RS1/16S104J
R 2019	RS1/16S473J
R 2025	RS1/16S333J
R 2026	RS1/16S333J
R 2027	RS1/16S683J
R 2028	RS1/16S683J
R 2029	RS1/16S433J
R 2030	RS1/16S433J
R 2601	RS1/16S472J
R 2602	RS1/16S473J
R 2604	RS1/16S101J
R 2605	RS1/16S101J
R 2606	RS1/16S102J
R 2607	RS1/16S102J
R 2608	RS1/16S473J
R 2609	RS1/16S473J
R 2610	RS1/16S472J
R 2611	RS1/16S223J
R 2612	RS1/16S473J
R 2613	RS1/16S472J
R 2614	RS1/16S392J

=====Circuit Symbol and No.	Part Name	Part No.
R 2615		RS1/16S102J
R 2616		RS1/16S473J
R 2617		RS1/16S102J
R 2618		RS1/16S473J
R 2619		RS1/16S223J
R 2620		RS1/16S223J
R 2621		RS1/16S103J
R 2622		RS1/16S223J
R 2625		RS1/16S102J
R 2626		RA3C221J
R 2627		RS1/16S681J
R 2628		RA3C221J
R 2629		RA3C102J
R 2630		RA3C221J
R 2631		RA3C221J
R 2632		RS1/16S472J
R 2633		RS1/16S222J
R 2634		RA2CQ473J
R 2635		RA2CQ222J
R 2636		RS1/16S473J
R 2637		RS1/16S221J
R 2638		RS1/16S102J
R 2639		RA2CQ221J
R 2640		RA2CQ221J
R 2641		RS1/16S473J
R 2642		RS1/16S222J
R 2645		RS1/16S473J
R 2646		RS1/16S473J
R 2647		RA2CQ473J
R 2648		RA2CQ473J
R 2649		RS1/16S224J
R 2650		RS1/16SS1003D
R 2652		RS1/16S221J
R 2653		RS1/16S473J
R 2654		RA2CQ473J
R 2902		RA2CQ471J
R 2903		RS1/16S561J
R 2905		RA2CQ471J

CAPACITORS

C 2001		CKSQYB105K10
C 2002		CKSQYB105K10
C 2003		CKSQYB105K10
C 2004		CKSQYB105K10
C 2005		CKSYB106K6R3
C 2006		CKSYB106K6R3
C 2007		CKSRYB222K50
C 2008		CKSRYB222K50
C 2009		CSZSR100M16
C 2010		CSZSR100M16
C 2011		CKSRYB104K16
C 2012		CKSRYB104K16
C 2013		CKSQYB105K10
C 2014		CKSQYB105K10
C 2015		CEV470M6R3
C 2019		CKSQYB105K10
C 2020		CKSQYB105K10
C 2021		CKSRYB221K50
C 2022		CKSRYB221K50
C 2023		CCSRCH330J50
C 2024		CCSRCH330J50
C 2601		CKSRYB102K50
C 2602		CKSRYB102K50
C 2603		CKSRYB104K16
C 2604		CKSRYB103K50

=====Circuit Symbol and No.	Part Name	Part No.
C 2605		CKSRYB103K50
C 2606		CKSRYB103K50
C 2607		CCSRCH220J50
C 2608		CKSRYB102K50
C 2609		CCSRCH220J50
C 2610		CCSRCH220J50
C 2611		CCSRCH220J50
C 2612		CCSRCH220J50
C 2615		CKSQYB105K10
C 2801		CKSRYB473K16
C 2802		CEV100M16
C 2803		CEV100M16
C 2901		CKSRYB103K50
C 2902		CKSRYB103K50
C 2909		CKSRYB561K50
C 2910		CKSRYB104K16
C 2912		CKSRYB103K50
C 2913		CKSRYB103K50

E

Unit Number : CWM6439(UC,ES model)
CWM6438(EW model)
Unit Name : Panel Keyboard Unit

MISCELLANEOUS

IC	1	IC	SBX8035-H
Q	1	Transistor(EW model)	DTD114EK
Q	2	Transistor(EW model)	DTD114EK
Q	3	Transistor(EW model)	FMG1A
D	1	LED	SML210LT
D	2	LED	CL155DPGD
D	3	LED	CL170PGCD
D	5	LED(EW model)	CL170DCD
S	1	Push Switch	CSG1122
S	2	Push Switch	CSG1122
S	3	Push Switch	CSG1122
S	4	Push Switch	CSG1122
S	5	Spring Switch	CSN1046
S	6	Push Switch	CSG1111

RESISTORS

R	1		RS1/4S681J
R	2		RS1/4S681J
R	3		RS1/16S100J
R	4		RS1/16S472J
R	5		RS1/4S681J
R	6		RS1/4S681J
R	7		RS1/4S681J
R	8		RS1/4S681J
R	9		RS1/16S202J
R	10		RS1/16S182J
R	11		RS1/16S302J
R	12		RS1/16S622J
R	13	(UC,ES model)	RS1/16S0R0J
R	14	(UC,ES model)	RS1/16S0R0J
R	15		RS1/16S472J
R	16		RS1/4S681J
R	18	(EW model)	RS1/10S0R0J

CAPACITORS

C	1	CKSQYB105K10

=====Circuit Symbol and No.	===	Part Name	Part No.

D Unit Number : CWM6426(UC,ES model) CWM6427(EW model)
Unit Name : LCD Keyboard Unit

MISCELLANEOUS

IC	21	IC	BU2092FV
IC	24	IC	PNA4603H00LB
Q	21	Transistor(EW model)	UMG1
Q	22	Transistor	DTC124EU
D	25	LED	SML020PDT
D	26	LED	SML020PDT
D	27	LED	SML020PDT
D	28	LED	SML020PDT
D	29	LED	SML020PDT
D	30	LED	SML020PDT
L	21	Inductor	LCTB2R2K2125
S	21	Push Switch(UC,ES model)	CSG1112
S	21	Push Switch(EW model)	CSG1113
S	22	Push Switch(UC,ES model)	CSG1112
S	22	Push Switch(EW model)	CSG1113
S	23	Push Switch(UC,ES model)	CSG1112
S	23	Push Switch(EW model)	CSG1113

RESISTORS

R	21		RS1/16SS102J
R	22		RS1/4S471J
R	23		RS1/16S202J
R	24		RS1/16S182J
R	25		RS1/16S302J
R	27		RS1/16S101J
R	28		RS1/16S104J
R	29		RS1/16S102J
R	31		RS1/16S473J
R	32		RS1/10S181J
R	33		RS1/10S181J
R	34		RS1/10S181J
R	35		RS1/10S181J
R	36		RS1/10S181J
R	37	(UC,ES model)	RS1/16S0R0J
R	38		RS1/4S681J
R	39		RS1/16S472J
R	40		RS1/16SS102J
R	41	(UC,ES model)	RS1/16S0R0J
R	47	(EW model)	RS1/16S0R0J

CAPACITORS

C	21		CKSQYB105K10
C	23		CKSYB475K10
C	24		CKSQYB103K50
C	28		CKSRYB474K10

F Unit Number : CWM6587
Unit Name : Encoder Unit

MISCELLANEOUS

VR	51	Volume 10kΩ(B)	CCW1025

J Unit Number :
Unit Name : SW Unit

MISCELLANEOUS

S	52	Switch(SENSOR)	CSN1052

=====Circuit Symbol and No.	===	Part Name	Part No.

G Unit Number : CWX2350
Unit Name : Control Unit

MISCELLANEOUS

IC	101	IC	UPC2572GS
IC	201	IC	UPD63702AGF
IC	301	IC	BA6797FM
IC	501	IC	PD4501B
IC	601	IC	TA2063F
IC	702	IC	BA05SFP
IC	801	IC	LB1930M
Q	101	Transistor	2SD1664
Q	102	Transistor	UMD2N
Q	601	Transistor	2SD1781K
Q	602	Transistor	2SD1781K
Q	603	Transistor	2SB709A
D	601	Diode	MA151WA
D	701	Diode	1SR154-400
X	201	Ceramic Oscillator 16.93MHz	CSS1363

RESISTORS

R	101		RS1/8S100J
R	102		RS1/8S120J
R	104		RS1/16S822J
R	105		RS1/16S682J
R	106		RS1/16S183J
R	107		RS1/16S822J
R	108		RS1/16S333J
R	109		RS1/16S683J
R	110		RS1/16S134J
R	111		RS1/16S273J
R	112		RS1/16S222J
R	113		RS1/16S103J
R	114		RS1/16S103J
R	115		RS1/16S102J
R	116		RS1/16S163J
R	117		RS1/16S163J
R	120		RS1/16S101J
R	121		RS1/16S101J
R	125		RS1/16S102J
R	201		RS1/16S104J
R	202		RS1/16S473J
R	206		RS1/16S101J
R	207		RS1/16S0R0J
R	208		RS1/16S0R0J
R	301		RS1/16S303J
R	302		RS1/16S203J
R	303		RS1/16S303J
R	304		RS1/16S203J
R	305		RS1/16S103J
R	306		RS1/16S203J
R	307		RS1/16S103J
R	308		RS1/16S103J
R	310		RS1/16S102J
R	311		RS1/16S102J
R	502		RS1/16S0R0J
R	601		RS1/16S102J
R	602		RS1/16S102J
R	603		RS1/16S223J
R	604		RS1/16S223J
R	605		RS1/16S162J
R	606		RS1/16S162J
R	607		RS1/16S103J
R	705		RS1/16S102J
R	706		RS1/16S681J
R	707		RS1/16S681J

=====Circuit Symbol and No.		===Part Name	Part No.
R	708		RS1/16S681J
R	709		RS1/16S681J
R	710		RS1/16S102J
R	714		RS1/16S102J
R	716		RS1/16S0R0J
R	717		RS1/16S0R0J
R	718		RS1/16S102J

CAPACITORS

C	101		CEVL101M6R3
C	102		CKSQYB104K16
C	103		CEVL470M6R3
C	104		CKSQYB334K16
C	105		CCSRCH330J50
C	106		CKSRYB103K25
C	107		CEVL4R7M35
C	108		CKSRYB273K25
C	109		CCSRCH101J50
C	110		CKSQYB104K16
C	111		CKSRYB332K50
C	112		CKSRYB473K16
C	113		CKSRYB103K25
C	114		CKSRYB391K50
C	115		CCSRCH121J50
C	116		CKSRYB682K25
C	117		CKSRYB333K16
C	118		CKSQYB334K16
C	119		CKSQYB334K16
C	120		CKSQYB334K16
C	121		CKSQYB334K16
C	122		CKSQYB104K16
C	123		CKSRYB472K50
C	124		CKSQYB104K16
C	125		CCSRCH6R0D50
C	126		CKSRYB153K25
C	127		CCSRCH102J25
C	201		CKSQYB334K16
C	202		CKSQYB104K16
C	203		CKSQYB104K16
C	204		CKSRYB471K50
C	303		CEVL470M16
C	305		CKSRYB103K25
C	306		CKSRYB103K25
C	309		CKSYB475K10
C	601		CEV101M6R3
C	602		CKSQYB104K16
C	603		CEV220M6R3
C	604		CEV4R7M35
C	605		CEV4R7M35
C	606		CKLSRB152K50
C	607		CKLSRB152K50
C	701		CEV100M25
C	702		CKSQYB334K16
C	703	22µF/6.3V	CCH1300
C	704		CEVL101M6R3

H Unit Number : CWX2191
Unit Name : Mechanism FPC Unit

D	1	LED	CL200IRX
D	2	LED	CL200IRX
D	3	LED	CL200IRX
S	1	Spring Switch(CLAMP)	CSN1033
S	2	Spring Switch(HOME)	CSN1033
R	1		RS1/8S0R0J
R	2		RS1/8S0R0J
R	3		RS1/8S751J
R	4		RS1/8S751J
R	5		RS1/8S751J

=====Circuit Symbol and No.		===Part Name	Part No.

I Unit Number :
Unit Name : Photo FPC Unit

P	1	Photo-transistor	CPT-230S-X
P	2	Photo-transistor	CPT-230S-X
P	3	Photo-transistor	CPT-230S-X

Miscellaneous Parts List

M	1	CRG Motor Assy(CARRIAGE)	CXB1670
M	2	LOAD Motor Unit(LOADING)	CXB1684
M	3	Motor(SPINDLE)	CXM1129
		Pickup Unit(Service)	CXX1290
M	51	Motor(ANGLE)	FX2484
M	52	Motor(POSITION)	FX2484

6. ADJUSTMENT

6.1 CHECKING THE GRATING AFTER CHANGING THE PICKUP UNIT

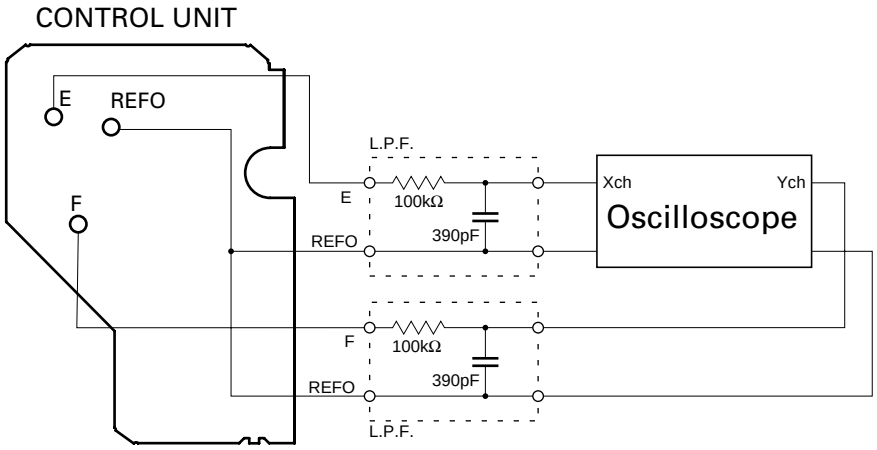
• Note :
Unlike previous CD mechanism modules the grating angle of the PU unit cannot be adjusted after the PU unit is changed. The PU unit in the CD mechanism module is adjusted on the production line to match the CD mechanism module and is thus the best adjusted PU unit for the CD mechanism module. Changing the PU unit is thus best considered as a last resort. However, if the PU unit must be changed, the grating should be checked using the procedure below.

• Purpose :
To check that the grating is within an acceptable range.

• Symptoms of Mal-adjustment :
If the grating is off by a large amount symptoms such as being unable to close tracking, being unable to perform track search operations, or track searching taking a long time, may appear.

• Method :

• Measuring Equipment	• Oscilloscope, Two L.P.F.
• Measuring Points	• E, F, REFOUT
• Disc	• ABEX TCD-784
• Mode	• TEST MODE



• Checking Procedure
1. In test mode, load the disc and switch the 5V regulator on.
2. Using the TR+ and TR- buttons, move the PU unit to the innermost track.
3. Press key 9 to close focus, the display should read "91". Press key 8 to implement the tracking balance adjustment the display should now read "81". Press key 9 4 times. The display will change, returning to "81" on the fourth press.
4. As shown in the diagram above, monitor the LPF outputs using the oscilloscope and check that the phase difference is within 75° . Refer to the photographs supplied to determine the phase angle.
5. If the phase difference is determined to be greater than 75° try changing the PU unit to see if there is any improvement. If, after trying this a number of times, the grating angle does not become less than 75° then the mechanism should be judged to be at fault.

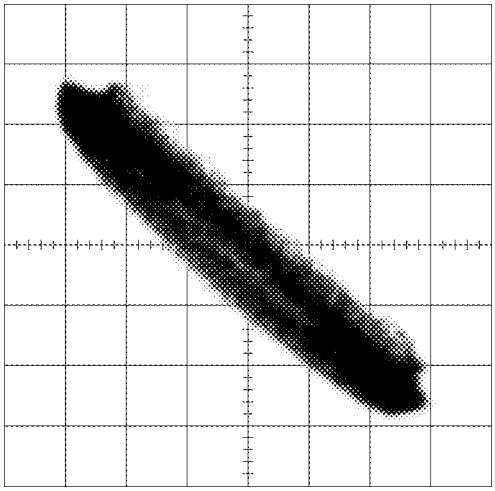
• Note
Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" (the phase difference changes as the disc rotates). The angle specified above indicates the average angle.

• Hint
Reloading the disc changes the clamp position and may decrease the "wobble".

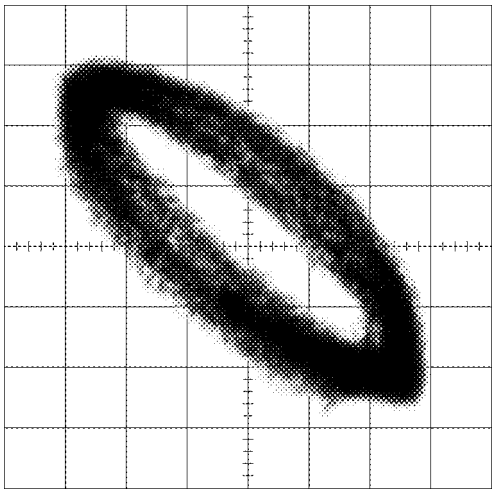
Grating waveform

Ech → Xch 20mV/div, AC
Fch → Ych 20mV/div, AC

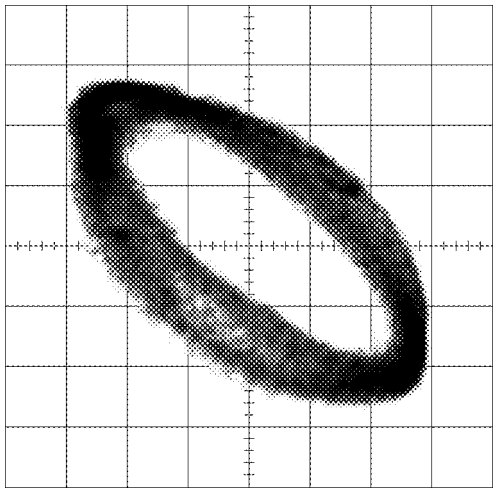
0°



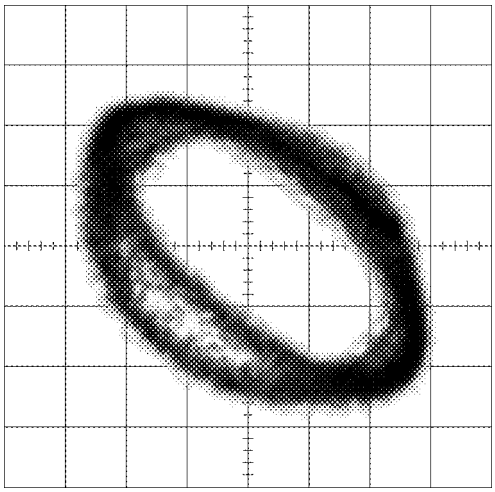
30°



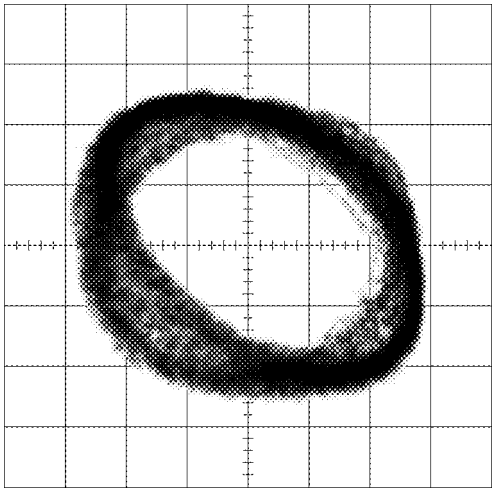
45°



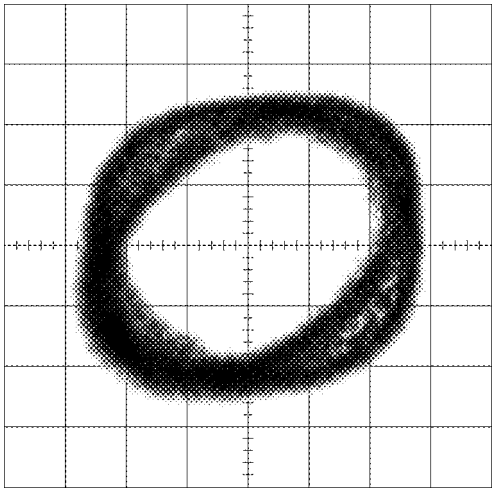
60°



75°



90°



7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 TEST MODE

● CD Test Mode

1)Precautions

- This unit uses a single power supply (+5V) for the regulator. The signal reference potential, therefore, is connected to REFO(approx. 2.5V) instead of GND.
  If REFO and GND are connected to each other by mistake during adjustments,not only will it be impossible to measure the potential correctly,but the servo will malfunction and a severe shock will be applied to the pick-up. To avoid this,take special note of the following.
  Do not connect the negative probe of the measuring equipment to REFO and GND together. It is especially important not to connect the channel 1 negative probe of the oscilloscope to REFO with the channel 2 negative probe connected to GND.
  Since the frame of the measuring instrument is usually at the same potential as the negative probe,change the frame of the measuring instrument to floating status.
  If by accident REFO comes in contact with GND,immediately switch the regulator or power OFF.

- Always make sure the regulator is OFF when connecting and disconnecting the various filters and wiring required for measurements.

- Before proceeding to further adjustments and measurements after switching regulator ON,let the player run for about one minute to allow the circuits to stabilize.

- Since the protective systems in the unit's software are rendered inoperative in test mode,be very careful to avoid mechanical and /or electrical shocks to the system when making adjustment.

- This unit is adjusted in a combination with the CD control unit (KEH-P7000, etc.). Each regulator key should be operated at the unit.
  With the KEH-P7000 taken up for reference, a description will be given below concerning how to enter into the test mode, including key operations. The key in the adjustment text is also one of the KEH-P7000 keys.

- How to enter into the test mode
  Switch ACC,back-up ON while pressing the 4 and 6 keys together.

- Resetting the test mode
  Switch ACC,back-up Off.

- Disc detection during loading and eject operations is performed by means of a photo transistor in this unit.Consequently,if the inside of the unit is exposed to a strong light source when the outer casing is removed for repairs or adjustment,the following malfunctions may occur.
  * During PLAY, even if the eject button is pressed,the disc will not be ejected and the unit will remain in the PLAY mode.
  * The unit will not load a disc.
    When the unit malfunctions this way,either re-position the light source,move the unit or cover the photo transistor.

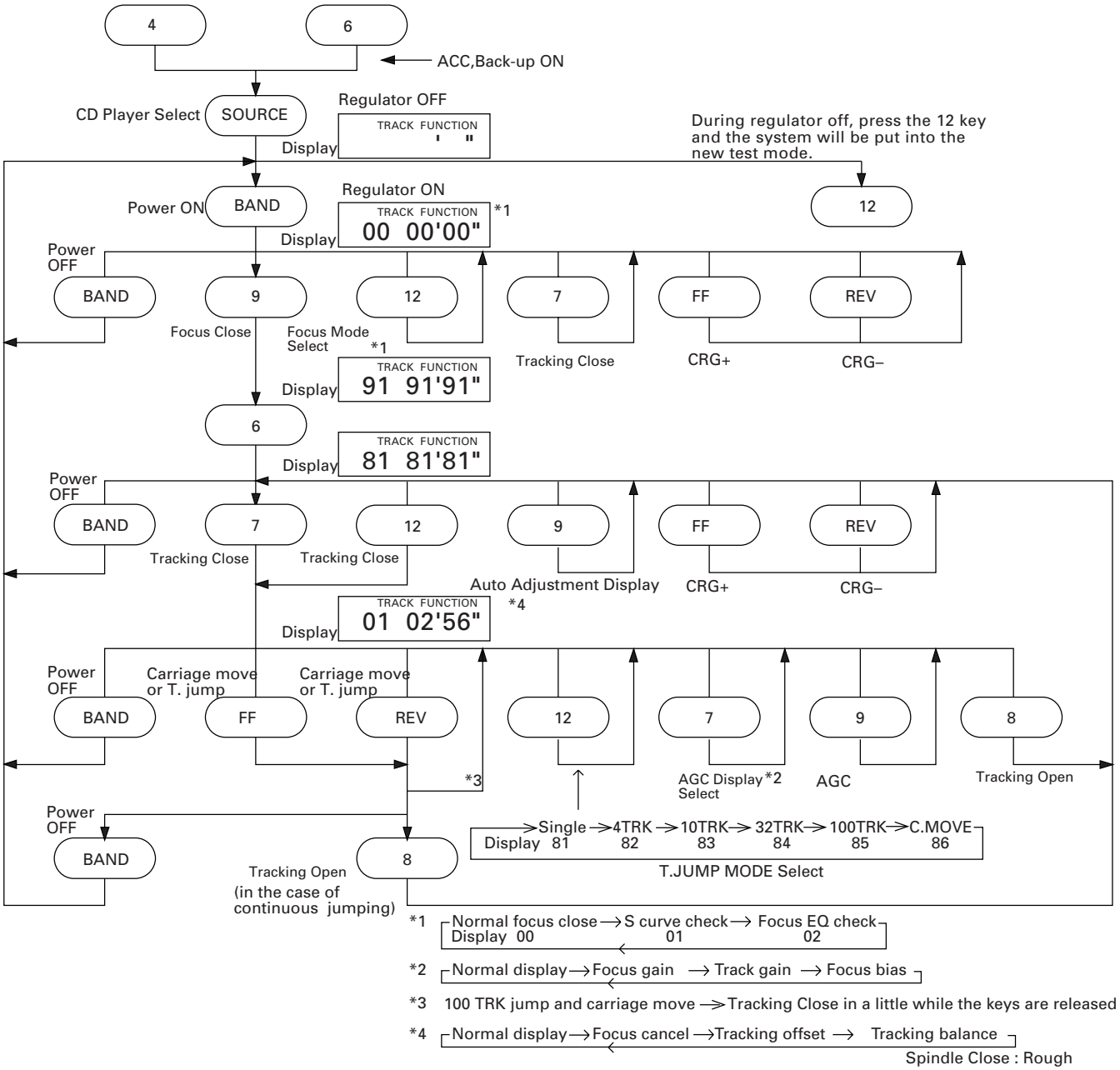
- When loading and unloading discs during adjustment procedures,always wait for the disc to be properly clamped or ejected before pressing another key. Otherwise, there is a risk of the actuator being destroyed.

- Turn power off when pressing the button FF or the button REV key for focus search in the test mode. (Or else lens may stick and the actuator may be damaged.)

- SINGLE/4TRK/10TRK/32TRK will continue to operate even after the key is released.Tracking is closed the moment C-MOVE is released.

- JUMP MODE resets to SINGLE as soon as power is switched off.

● Flow Chart


4
6
ACC,Back-up ON
CD Player Select
SOURCE
Regulator OFF
TRACK FUNCTION
Display
During regulator off, press the 12 key and the system will be put into the new test mode.
Power ON
BAND
Regulator ON
TRACK FUNCTION
00 00'00"
*1
12
Power OFF
BAND
9
12
7
FF
REV
Focus Close
Focus Mode Select
*1
Tracking Close
CRG+
CRG–
TRACK FUNCTION
91 91'91"
6
TRACK FUNCTION
81 81'81"
Power OFF
BAND
7
12
9
FF
REV
Tracking Close
Tracking Close
Auto Adjustment Display
*4
CRG+
CRG–
TRACK FUNCTION
01 02'56"
Power OFF
Carriage move or T. jump
Carriage move or T. jump
BAND
FF
REV
12
7
9
8
*3
AGC Display Select
*2
AGC
Tracking Open
Power OFF
Single
4TRK
10TRK
32TRK
100TRK
C.MOVE
Display 81
82
83
84
85
86
T.JUMP MODE Select
BAND
8
Tracking Open
(in the case of continuous jumping)
*1 Normal focus close → S curve check → Focus EQ check
Display 00 01 02
*2 Normal display → Focus gain → Track gain → Focus bias
*3 100 TRK jump and carriage move → Tracking Close in a little while the keys are released
*4 Normal display → Focus cancel → Tracking offset → Tracking balance
Spindle Close : Rough

7.2.2 TEST MODE

● Error Number Indication

The system enters error mode to display the cause of error with a number when the system cannot operate CD or stops operation because of an error. The purpose of this measure is to reduce frequency of calls from users asking help for problems that are caused by incorrect operation by user, as well as to assist analysis and repair in servicing.

(1) Basic means of display

- An error code will be written on DMIN (minute area for display) and DSEC (second area for display) when CSMOD (CD mode area for system) is SERBORM.
  The same data will be written on DMIN and DSEC.
  DTNO shall be blank as before.
- Display examples of the head unit
  Error codes will be displayed as shown below, depending on the capability of LCD. An error number will be displayed in the place of "xx."
- 8-digit display ERROR-XX

With OEM products, display of error codes shall be according to the specificatins of the manufacturer.

(2) Error codes

Error code	Classification	Description	Cause / Detail
10	ELECTRIC	Carriage home failure	Carriage doesn't move to or from the innermost position →Home switch failed and/or carriage immobile
11	ELECTRIC	Focus failure	Focus failed →Defects, disc upside-down, severe vibration
12	ELECTRIC	SETUP failure Subcode failure	Spindle failed to lock or subcode unreadable →Spindle defective, defect, severe vibration
14	ELECTRIC	Mirror failure	Unrecorded CD-R The disc is upside-down, defects, vibration
17	ELECTRIC	Set up failure	AGC protect failed →Defects, disc upside-down, severe vibration
19	ELECTRIC	Improper T.BAL adjustment	Value of T.BAL adjustment is out of parameter.
30	ELECTRIC	Search time out	Failed to reach target address →Carriage / tracking defective and/or defects
A0	SYSTEM	Power failure	Power overvoltage or short circuit detected →Switching transistor defective and/or power abnormal

(3) Number of error codes

One hundred error codes (00 to 99) will be available.

(4) Remarks

- Error codes are not displayed for the mechanism alone (because CD is OFF when an mechanical error is generated).
- When the system cannot read TOC, it is not deemed as an error, and the system continues operation to a certain extent.
- Be sure to take measures as shown in the display examples whenever designing a new head unit.
- The first digit of an error code has a meaning as follows:
  1X : Error related to setup
  3X : Error related to the search function
  AX : Other errors

● New Test Mode

When S-CD is specified as the source, basically the system plays as normal operation. After setup, the system displays the cause and time (absolute time) of an error if focus search is improper, spindle lock is removed, subcode cannot be read, or sound is skipped. During setup, the system displays the operation status of CD control software (internal RAM : CPOINT). The purpose of these displays and functions are to detect aging of servicing, as well as to improve efficiency of defect analysis.

(1) How to enter NEW TEST Mode

1. Reset the system by pressing keys (depending on the product) to enter the conventional Test mode.
2. Select S-CD as the source by pressing the source or CD key, then inserting a disc. Confirm that the regulator is OFF. Press the Switch Jump Mode key.
3. After that, the system will stay in the new Test mode, regardless of whether S-CD is OFF or ON.

To exit from the new Test mode, reset the system.

See the test mode flow chart Page 49.

(2) Relations of keys

keys	Test Mode		New Test Mode	
	Regulator OFF	Regulator ON	PLAY in progress	Error Protection
BAND	To Regulator ON	To Regulator OFF	—	Time / Err No.select
FF	—	FWD-Kick	FF / TR+	—
REV		—	REV-Kick	REV / TR- —
7	—	Tracking Close	Scan	—
8	—	Tracking Open	RPT	—
9	—	Focus Close	RDM	—
—	—	Focus Open	—	—
—	—	Jump Off	—	—
12	To New Test Mode	Jump Mode select	Auto / Manu	T.No. / Time select

Operations, such as EJECT, CD ON/OFF are performed normal mode.

(3) Error Cause, Error Code

Code	Classification	Description	Cause / Details
40	ELECTRIC	Put out of focus	FOK=Low has continued for 100 msec →Damaged or soiled disc. vibration, or detective servo
41	ELECTRIC	Spindle unlock	LOCK=has continued for 100 msec →Damaged or soiled disc. vibration, or detective servo
42	ELECTRIC	Failed to read subcode	The system could not read subcode for 100 msec →Damaged or soiled disc. vibration, or detective servo
43	ELECTRIC	Sound skipped	The last-address-memory function activated →Damaged or soiled disc. vibration, or detective servo

There will be no mechanical error during aging. Error codes should be displayed in the same manner as in Normal mode.

7.1.2 DISASSEMBLY

● Removing the Detach Grille Assy (Fig.1)

1. Remove the detach grille assy.

● Removing the Grille Assy (Fig.1)

1. Remove the two screws.
2. Disengage the stopper eight of the grille assy.
3. Disconnect the connector.

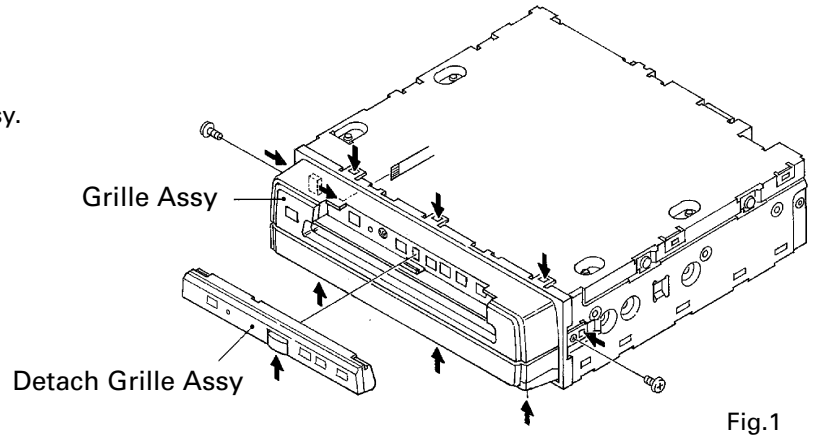


Fig.1

● Removing the Display Assy (Fig.2)

1. Remove the five screws.
2. Remove the holder.
3. Remove the case.
4. Disconnect the connector.
5. Pull out the display assy.

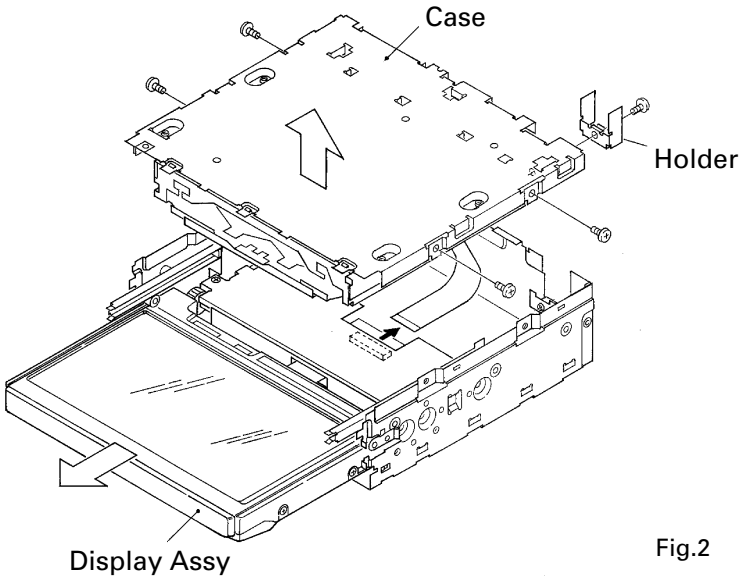


Fig.2

● Removing the CD Mechanism Module (Fig.3)

1. Remove the four screws.
2. Disconnect the two connectors.
3. Remove the CD mechanism module.

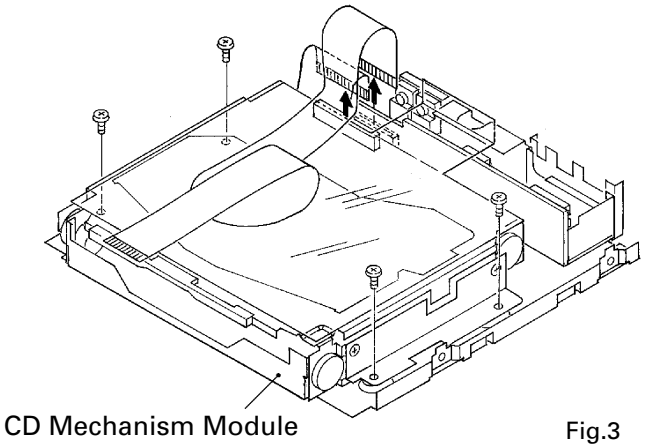


Fig.3

● Removing the CD Micro Computer Unit (Fig.4)

1. Remove the solder at the 2 points marked with Arrow X inthe figure.
2. Straighten the two tabs indicated by Arrow V.
3. Remove the two screws A.
4. Disconnect the three connectors indicated by Arrow Z.
5. Disconnect the connector B , the connector C , the connector D and the connector E.
6. Remove the CD micro computer unit.

● Removing the System Micro Computer Unit (Fig.4)

1. Remove the screw F.
2. Straighten the three tabs indicated by Arrow G.
3. Remove the system micro computer unit.

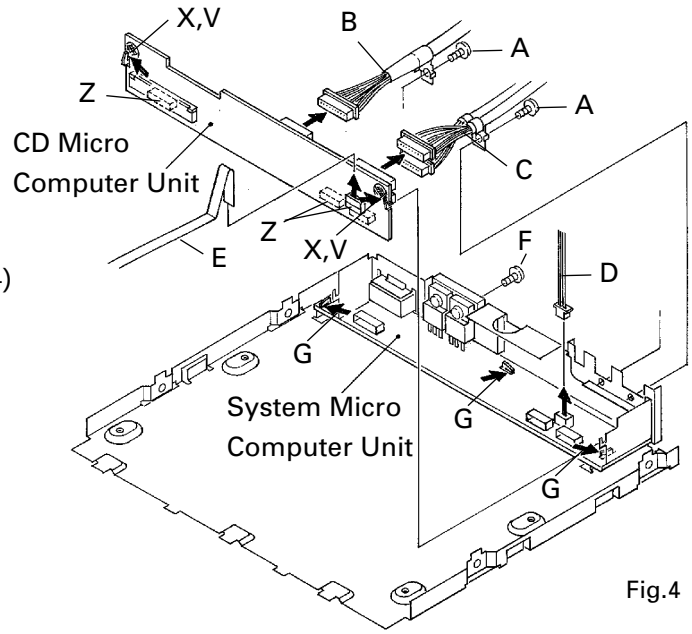


Fig.4

● Removing the Case (Fig.5)

1. Remove the four screws.
2. Remove the case.

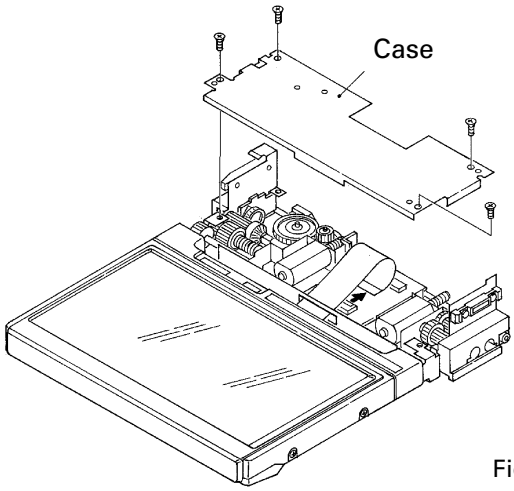


Fig.5

● Removing the Case (Fig.6)

1. Remove the four screws A.
2. Remove the two screws C.
3. Remove the case.
4. Remove the six screws B.

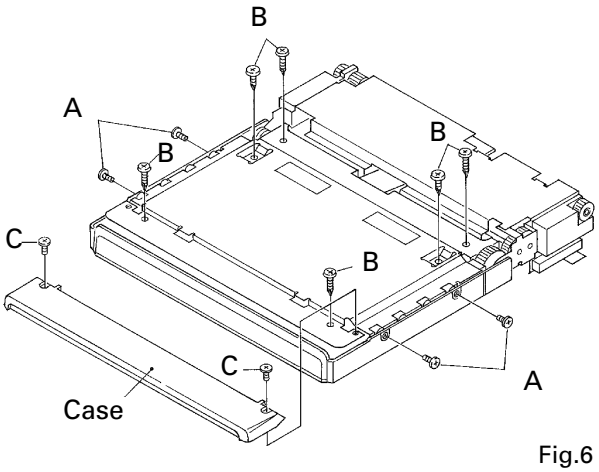


Fig.6

● Removing the Relay Unit (Fig.7)

1. Remove the connector B , connector C and connector D.
2. Straighten the two tabs indicated by Arrow (I).
3. Remove the relay unit.

● Removing the Angle Motor Section (Fig.7)

1. Remove the screw E and the screw F.
2. Remove the encoder unit and the holder.
3. Remove the screw H and the two screws G.
4. Remove the angle motor section.

● How to installing the Encoder Unit (Fig.7-1)

1. When mounting the gear, install it so that the A section faces in the direction shown in the Fig.7-1.

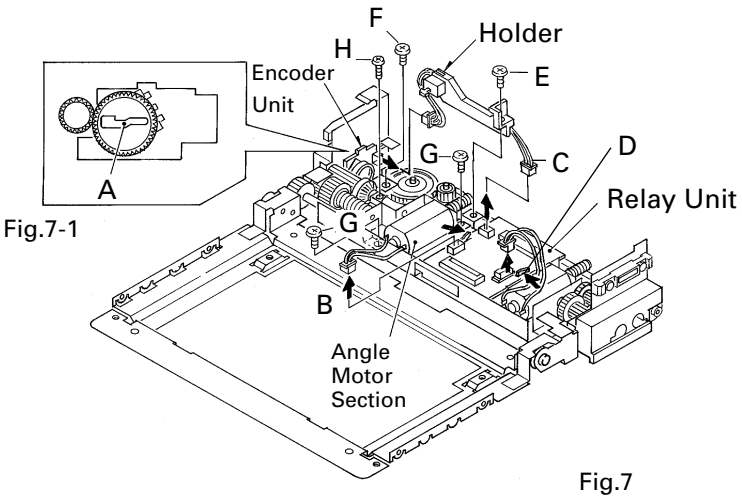


Fig.7-1

Fig.7

● Removing the Position Motor Section (Fig.8)

1. Loosen the two screws A (after completing the steps 1 to 3 of "Removing the Relay Unit").
2. Remove the position motor section.

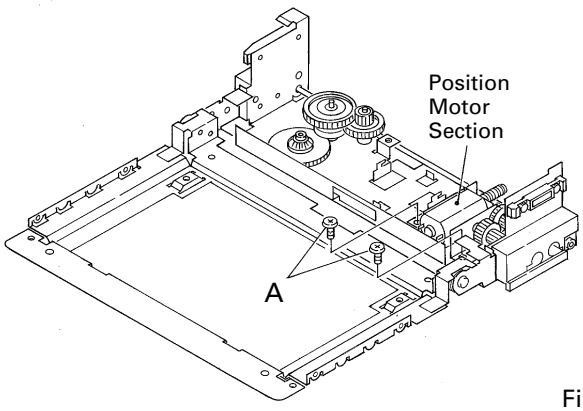


Fig.8

● Removing the LCD Keyboard Unit (Fig.9)

1. Remove the screw.
2. Remove the holder.
3. Remove the connector and the LCD keyboard unit.

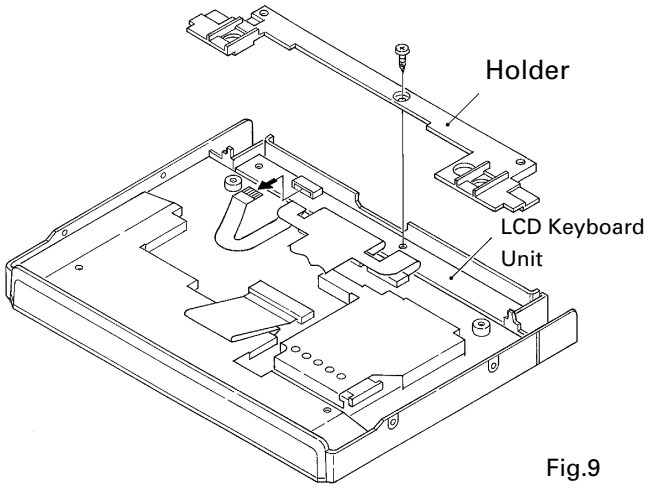


Fig.9

When removing the floating unit, stop the mechanism during playback (to unlock the mechanism).

- Removing the damper and frame (Fig.10)
- Removing the floating unit (Fig.10)
- Removing the clamper arm (Fig.10)

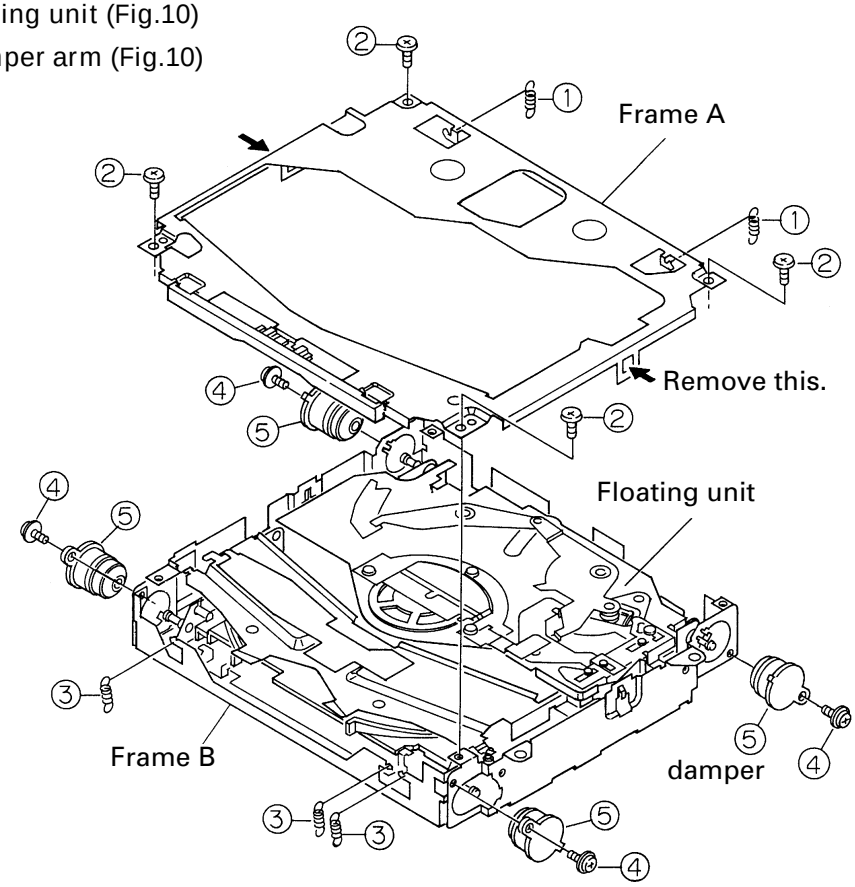


Fig.10

- Removing the spindle motor (Fig.11)
- Removing the Carriage Motor (Fig.11)

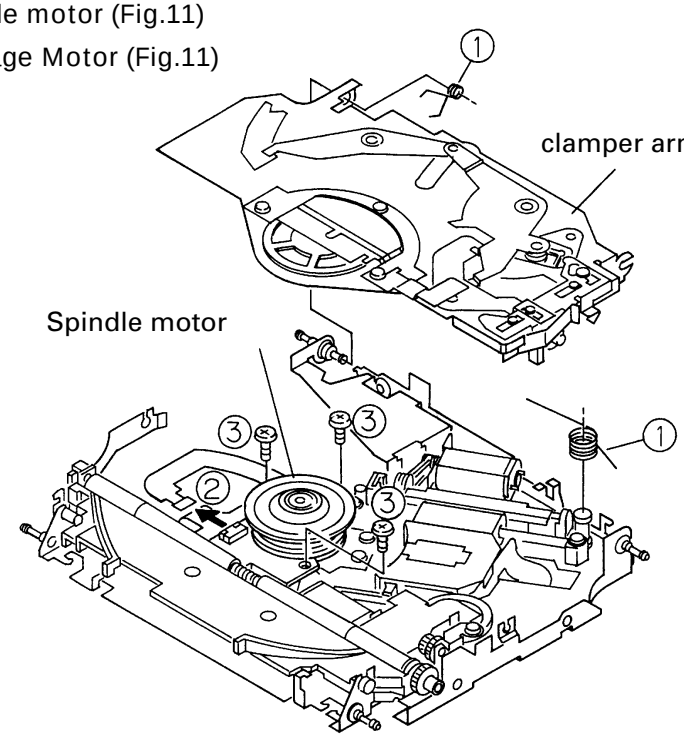


Fig.11

● Removing the Loading motor (Fig.12)

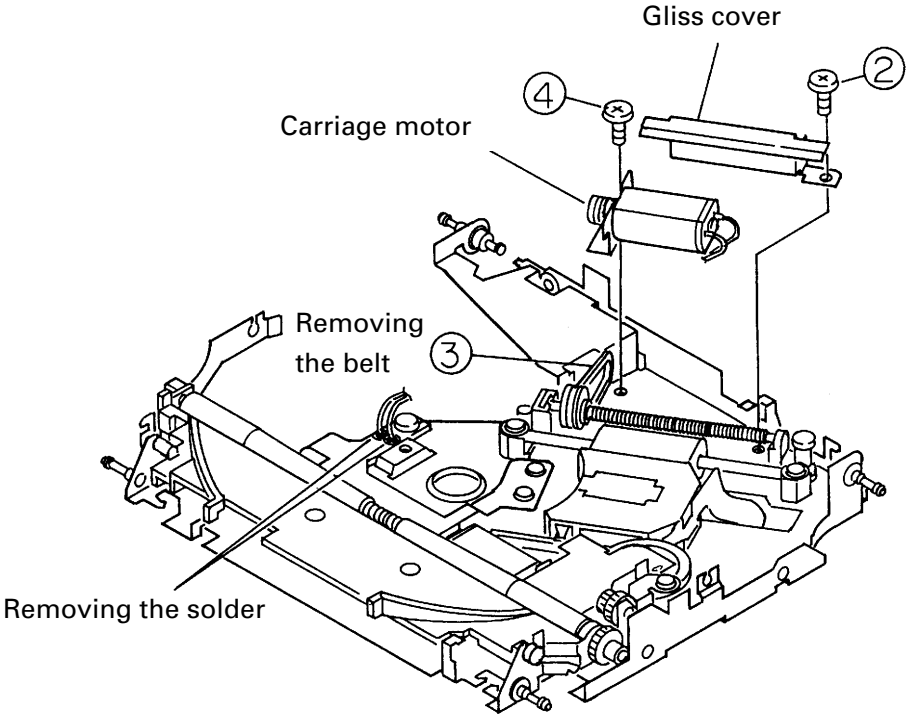


Fig.12

● Removing the PU unit (Fig.13)

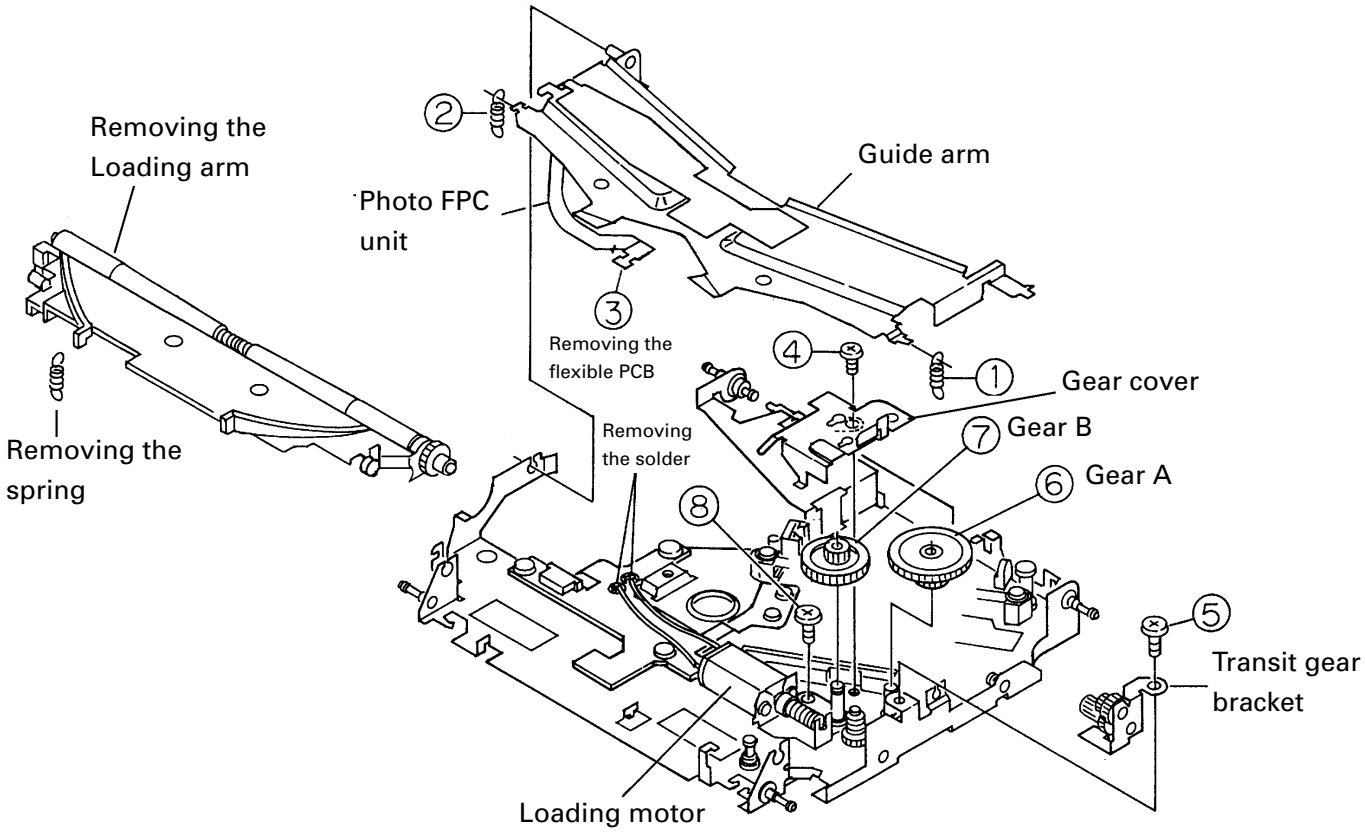
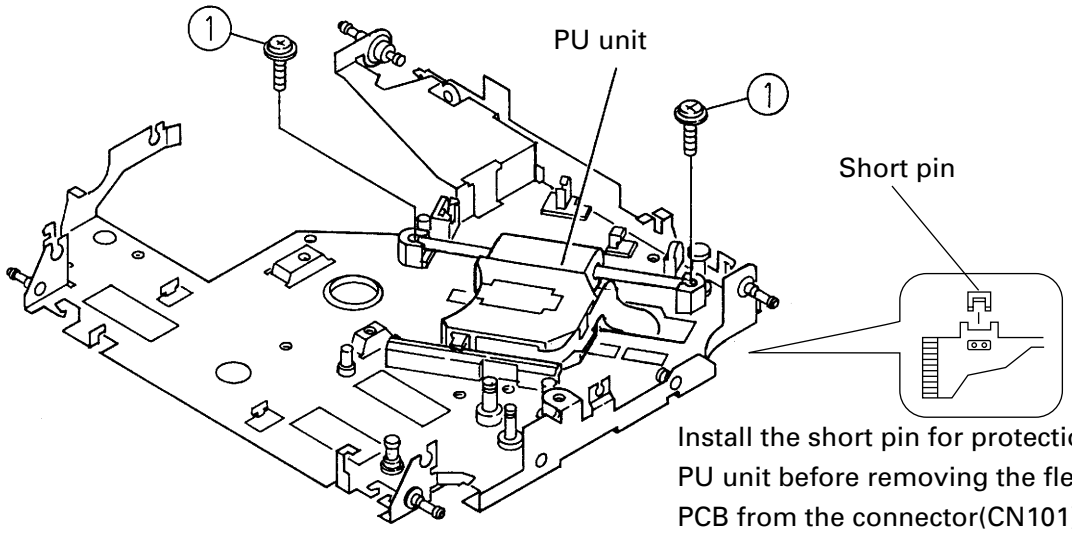


Fig.13

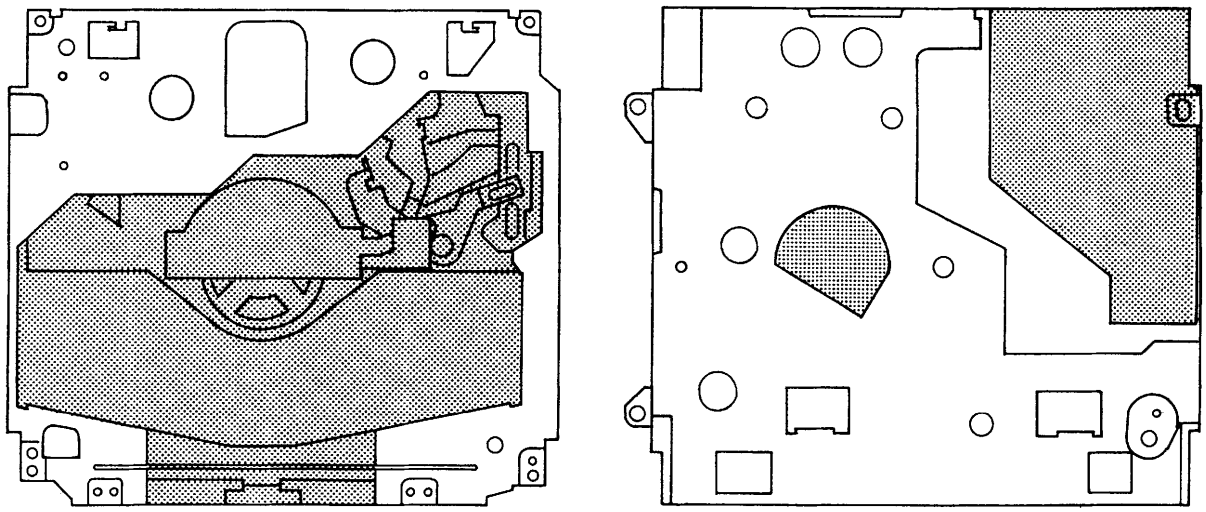
When tighten screw (1), tighten with a torque of 1.8 kg-cm. (Fig.14)



Install the short pin for protection or the PU unit before removing the flexible PCB from the connector(CN101).

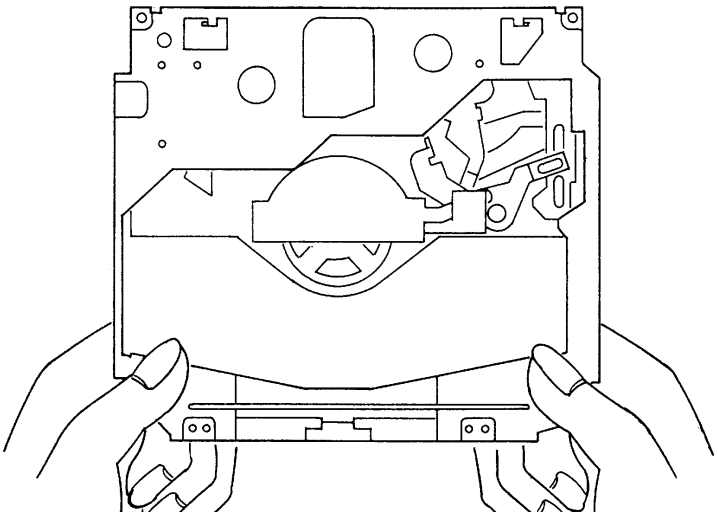
Fig.14

● How to hold the CD mechanism module (Fig.15,Fig.16)



Do not hold the parts indicated in dark color.

Fig.15



How to hold the module

Fig.16

● Cautions on assembling (Fig.17)

1. When installing the display assy in the case, use the reference scale on the surface of the case to set the display assy properly (not slantingly), as shown in the Fig.17.

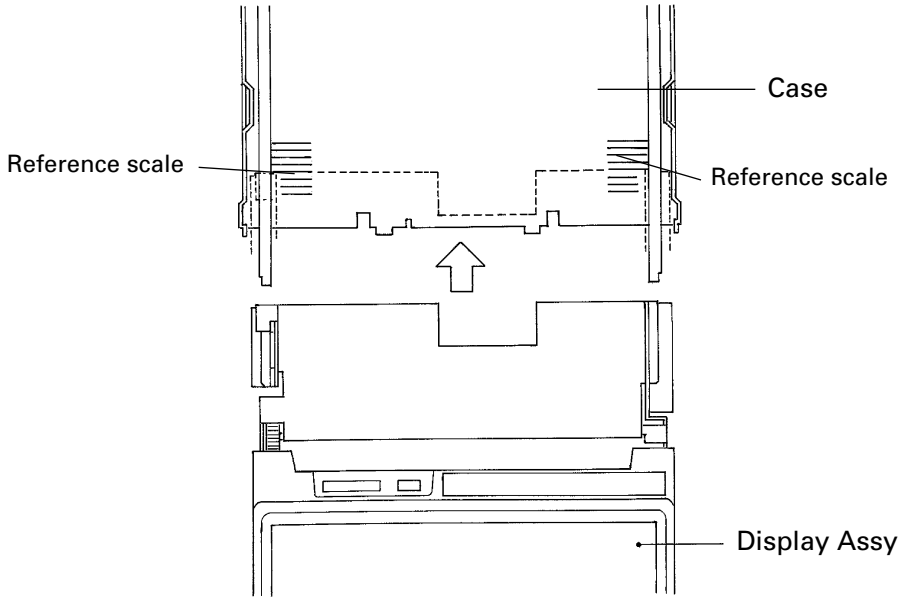
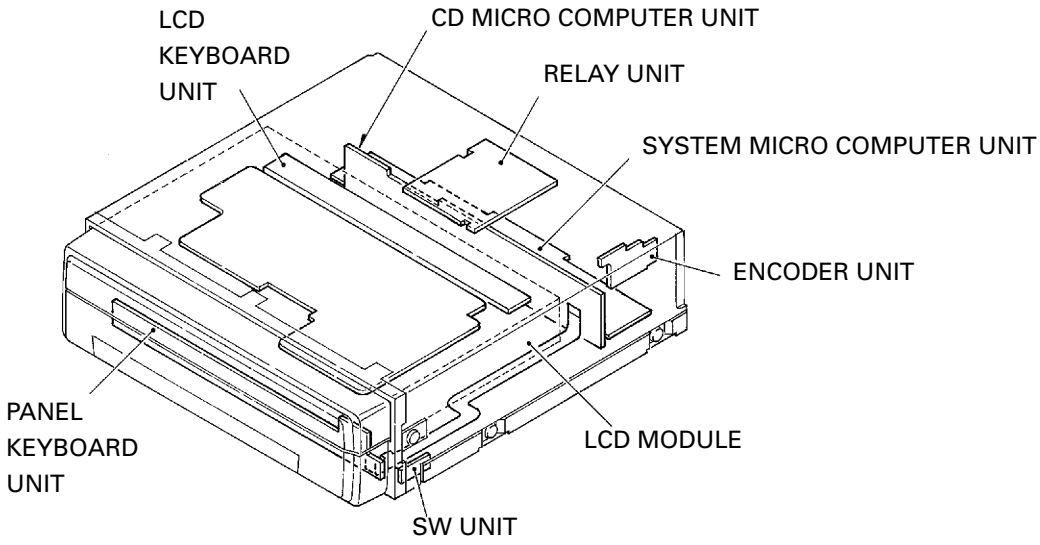
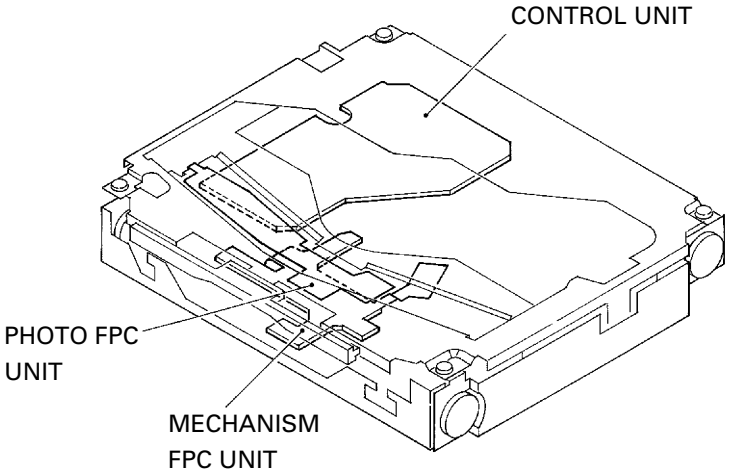


Fig.17

7.1.3 PCB LOCATIONS

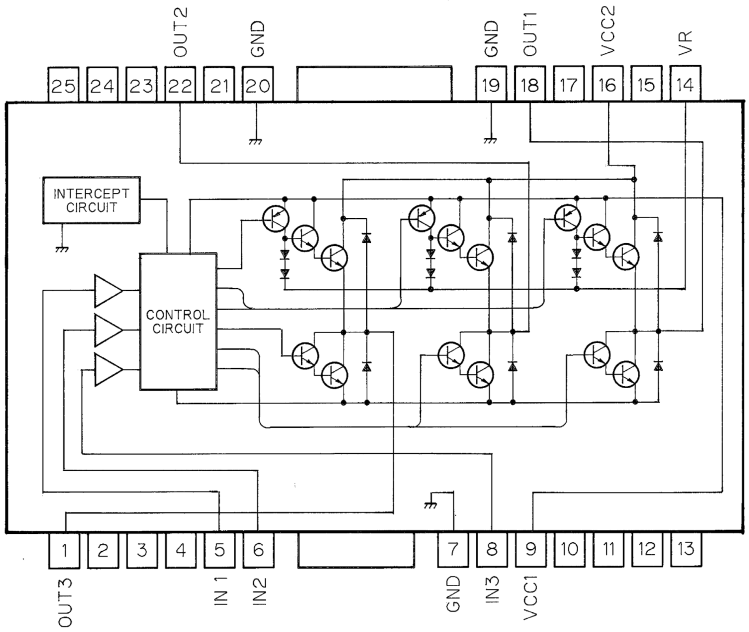




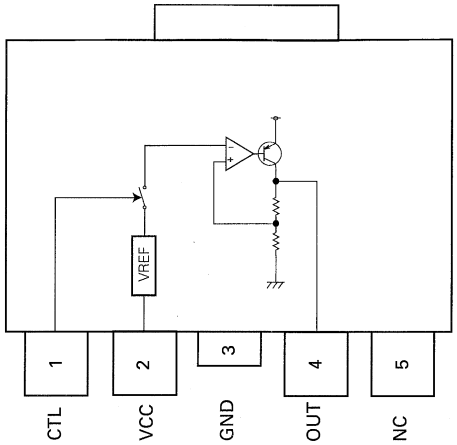
7.2 PARTS

7.2.1 IC

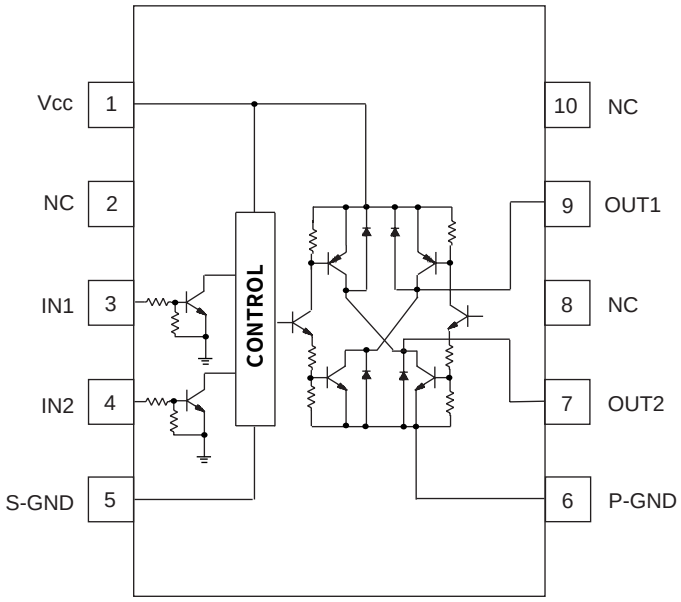
BA6247FP



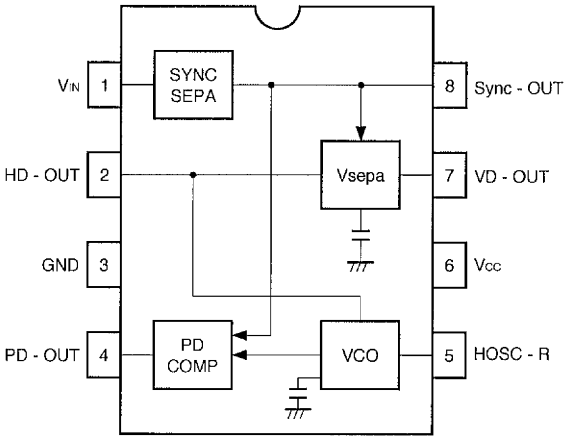
BA00ASFP



LB1930M



BA7071F

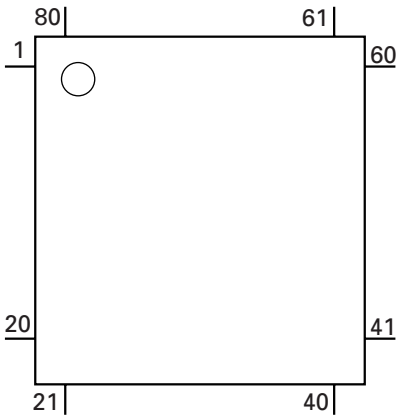


● Pin Functions(PE5046B)

Pin No.	Pin Name	I/O	Format	Function and Operation
1	FOK	I		Focus OK input
2	MIRR	I		Mirror detect input
3	LOCK	I		Spindle lock input
4	AVss			A/D GND electric potential
5	NC			Not used
6	EMPH	O	C	Pre-emphasis output
7	AVREF1	I		A/D Reference electric potential input
8	TSI	I		Decode IC serial data input
9	NC			Not used
10	TSCK	O	C	Decode IC serial clock output
11	XSI	I		Serial data input from CD LSI
12	XSO	O	C	Serial data output to CD LSI
13	$\overline{\text{XSCK}}$	O	C	Serial clock output to CD LSI
14	XA0	O	C	CD LSI command/data control output
15	$\overline{\text{XSTB}}$	O	C	Strobe output to CD LSI
16	NC			Not used
17	BDATA	I/O	C	P-Bus serial data input/output
18	$\overline{\text{BSCK}}$	I/O	C	P-Bus serial clock input/output
19	$\overline{\text{XRST}}$	O	C	CD LSI reset output
20	CONT	O	C	Servo driver voltage control output
21	CD5VON	O	C	CD +5V power supply control output
22	VDCONT	O	C	VD power supply control output
23	CDMUTE	O	C	CD Mute control output
24	CDEJET	O	C	Loading Motor Eject control output
25	CDLOAD	O	C	Loading Motor Load control output
26	BMUTE	O	C	Bus mute output
27	$\overline{\text{CLAMP}}$	I		Disc clamp SW input
28	$\overline{\text{CRST}}$	O	C	Compressor IC reset output
29	CBANK0	O	C	Compressor IC bank set output 0
30	CBANK1	O	C	Compressor IC bank set output 1
31	CBANK2	O	C	Compressor IC bank set output 2
32	$\overline{\text{CCS}}$	O	C	Compressor IC chip select
33	Vss			GND electric potential
34	DSET	O	C	Disc set indicator light output
35	SCONT	O	C	Spindle double speed output
36-54	NC			Not used
55	ERREJ	I		Disc eject select input at the error
56	$\overline{\text{CSENS}}$	I		Ope-fla close sense input
57	TXARI	I		TX output select input
58	BSRQ	I/O	C	P-Bus service request output
59	BRXEN	I/O	C	P-Bus reception enable status
60	$\overline{\text{RESET}}$	I		System reset input
61	NC			Not used
62	$\overline{\text{BRST}}$	I		P-Bus Reset input
63	$\overline{\text{DQSY}}$	I		TEXT decode read permission input
64-66	NC			Not used
67	$\overline{\text{ADENA}}$	O	C	A/D reference voltage supply control input
68	VDD			Positive power supply
69	X2			Main clock oscillator connection pin
70	X1			Main clock oscillator connection pin
71	IC(Vpp)			Internally Connected (Vss)
72	NC			Not used
73	$\overline{\text{TESTIN}}$	I		Test program start input
74	AVDD			A/D analog power supply
75	AVREF0			A/D reference voltage input
76	EJTENS			Disc eject position sense input
77	DSCSNS			Disc set defect input

Pin No.	Pin Name	I/O	Format	Function and Operation
78	VDSENS	I		VD short sense input
79	TEMP	I		Temperature sense input
80	NC			Not used

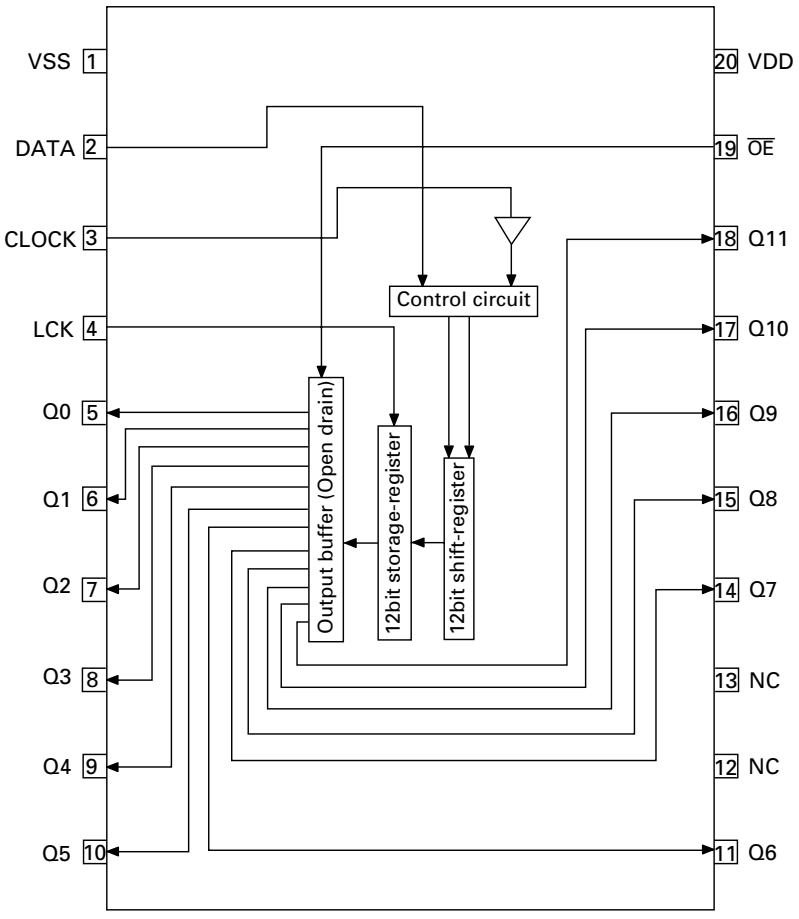
*PE5046B



Format	Meaning
C	C MOS

IC's marked by* are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

BU2092FV



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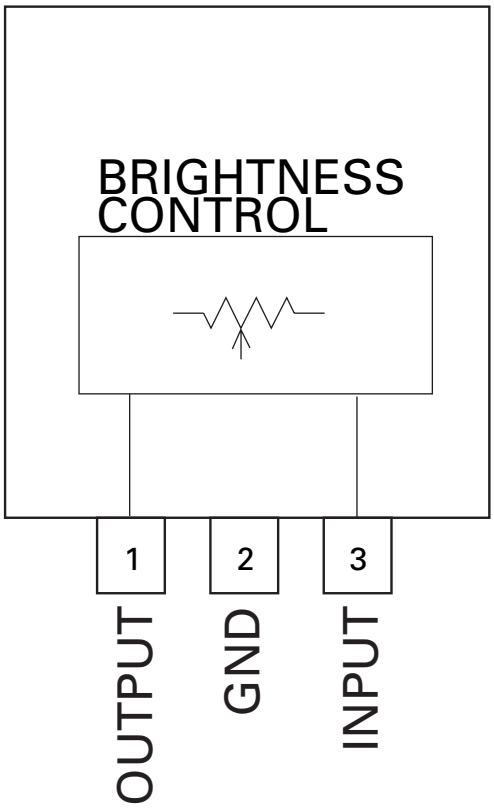
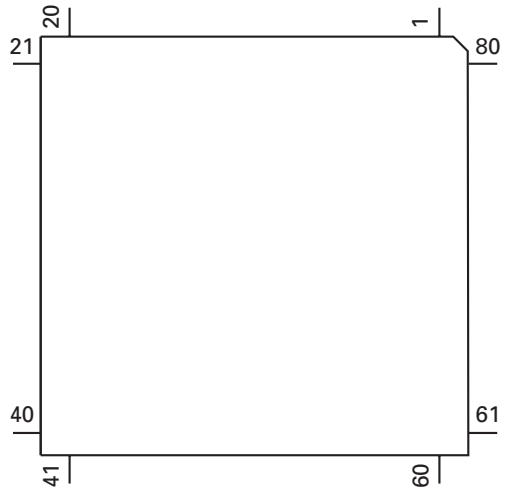


● Pin Functions (PE5038A)

Pin No.	Pin Name	I/O	Format	Function and Operation
1-3	NC			Not used
4	AVSS			GND
5	BRIGHT		C	Bright control output
6	DIMMER		C	Dimmer control output
7	AVREF1			D/A converter reference voltage (Connects to VDD)
8	LEDDT	O	C	Data output for the WIDE MODE indicating LED driver
9	LEDCLK	O	C	Clock output for the WIDE MODE indicating LED driver
10	LEDLCK	O	C	Lock output for the WIDE MODE indicating LED driver
11	BSI(TSI)	I	C	P-BUS data input
12	BSO(TSO)	I/O	C	P-BUS data output
13	BSCK(TSCK)	I/O	C	P-BUS clock output
14	BSRQ	I	C	P-BUS communication command input
15	BRXEN	I/O	C	P-BUS communication
16	BRST	O	C	P-BUS bus-resetting output
17	LEDOE	O	C	LED activation authorizing output for the WIDE MODE indicating LED driver
18	DUALILM	O	C	Dual illumination color setting output ($\overline{\text{GREEN}}$/AMBER)
19	NC			Not used
20	MTRS	O	C	Storage motor speed adjusting output
21	MTRSEL	O	C	Storage motor rotating direction designating output
22	MTR1	O	C	Storage motor changeover/brake-mode designating output 1
23	MTR2	O	C	Storage motor changeover/brake-mode designating output 2
24	MTRPW	O	C	Flap motor driver power switch output
25	ASEL	O	C	Audio select output ($\overline{\text{IP-BUS}}$/SCD)
26-29	NC			Not used
30	$\overline{\text{PUSHSW}}$	I	C	Monitor pushing-out end sensing switch input
31	$\overline{\text{PULLSW}}$	I	C	Monitor pulling back end sensing switch input
32	NC			Not used
33	VSS			GND
34	$\overline{\text{PWSENS}}$	I	C	Navigation/R513 power “ON” input
35	$\overline{\text{PWSAVE}}$	O	C	Power save output
36	$\overline{\text{DSENS}}$	I	N	Detach input
37	$\overline{\text{ISENS}}$	I	N	Illumination sensor input
38	$\overline{\text{DLED}}$	O	N	Burglar alarm LED driving output
39	$\overline{\text{SWVDD}}$	O	N	Remote controller power and external light sensing power outputs
40	BLTPW	O	C	LCD backlight output
41	VPOWER	O	C	Video circuit power output
42	NC			Not used
43	MONFLAME	O	C	Monitor frame control output ($\overline{\text{NTSC}}$/PAL)
44	MODE1	O	C	Display mode changeover output 1
45	NC			Not used
46	MODE2	O	C	Display mode changeover output 2
47	MODE3	O	C	Display mode changeover output 3
48	MODELIN1	I	C	Model discriminating input for existence or not of CD ($\overline{\text{CD exists}}$/CD does not exist)
49	NC			Not used
50	IPPW	O	C	IP-BUS power control output
51,52	NC			Not used
53	ILMPW	O	C	ILMPW output
54	$\overline{\text{MUTE}}$	O	C	Integrated mute output
55	SYSPW	O	C	SYSPW output
56	TX	O	C	IP-BUS date output
57	RX	I	C	IP-BUS data input
58,59	NC			Not used
60	$\overline{\text{RESET}}$	I		Resetting
61	VSYNCIN	I		Frame frequency 50/60Hz (VSINC) input
62	VSELIN1	I		VSEL input 1

Pin No.	Pin Name	I/O	Format	Function and Operation
63	VSELIN2	I	C	VSEL input 2
64	REMIN	I		Remote controlling signal input
65	$\overline{\text{ASENS}}$	I	C	ACC sensor input
66	$\overline{\text{BSENS}}$	I	C	Backup input
67	NC			Not used
68	VDD			VDD
69	X2			Oscillator output
70	X1			Oscillator input
71	IC			Connection to grounding circuit
72	XT2			Sub-clock terminal
73	TESTIN	I		Test mode
74	AVDD	I		Analog power for A/D converter
75	AVREF0	I		Reference voltage input for A/D converter
76	LSENS		C	External light sensor input
77	KEYIN1		C	Key input 1
78	KEYIN2		C	Key input 2
79	ANGLEIN		C	Monitor angle controlling analog signal input
80	MODELIN2		C	Destination discriminating analog input

*PE5038A

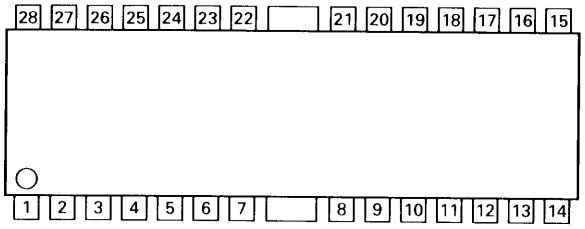


Format	Meaning
C	C MOS
N	N channel open drain

● Pin Functions (BA6797FM)

Pin No.	Pin Name	I/O	Function and Operation
1	OUT1-A	O	Driver CH1 output
2	OUT1-B	O	Driver CH1 output
3	PRE-OUT1	O	CH1 pre-amplifier output
4	IN1(-)	I	CH1 pre-amplifier inverted input
5	IN1(+)	I	CH1 pre-amplifier input
6	REG-B	O	External Tr base connection
7	REG-OUT	O	Fixed voltage output (External Tr collect connection)
8	BIAS-IN	I	Bias input
9	MUTE	I	Mute control
10	IN2(+)	I	CH2 pre-amplifier input
11	IN2(-)	I	CH2 pre-amplifier inverted input
12	PRE-OUT2	O	CH2 pre-amplifier output
13	OUT2-B	O	Driver H2 output
14	OUT2-A	O	Driver CH2 output
15	GND		Sub straight GND
16	OUT3-A	O	Driver CH3 output
17	OUT3-B	O	Driver CH3 output
18	PRE-OUT3	O	CH3 pre-amplifier output
19	IN3(-)	O	CH3 pre-amplifier inverted output
20	IN3(+)	O	CH3 pre-amplifier output
21	VCC		VCC
22	VCC		VCC
23	IN4(+)	O	CH4 pre-amplifier output
24	IN4(-)	O	CH4 pre-amplifier inverted output
25	PRE-OUT4	O	CH4 pre-amplifier output
26	OUT4-B	O	Driver CH4 output
27	OUT4-A	O	Driver CH4 output
28	GND		Sub straight GND

BA6797FM



7.3 MECHANISM DESCRIPTIONS

● Outlines of the hardwares

Drive motors

Discharge (position) motor

Angle raising (angle) motor

Sensors

Angle detection rotary encoder

End of discharge detecting switch (“L” when detection is made)

Angle 0-degree detecting switch

End of storage detecting switch (“L” when detection is made)

● Electric conditions

Sensor signals

Encoder

ANGLEIN: Angle sensing analog sensor

Sensor signals

(PUSH)

LIFT SW: End of discharge detecting sensor (“L” when detection is made)

PULL SW: End of storage detecting sensor (“L” when detection is made)

Control signals

MTRPW : Motor power control (“H” when turned “ON”)

MTR1 : Angle motor control signal (“H” when turned “ON”)

MTR2 : Position motor control signal (“H” when turned “ON”)

MTRS : Motor speed control (“L” for high speed and “H” for low speed)

MTRSEL : Motor rotation direction control

(Horizontal IN: H/OUT:

(Angled UP: H/DOWN: L

Motor terminal voltage

High speed mode: VMH = 7.0V

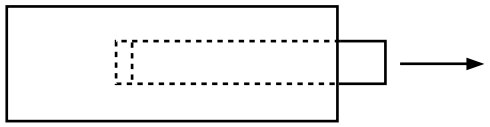
Low speed mode: VML = 6.2V

● Outline of the operation

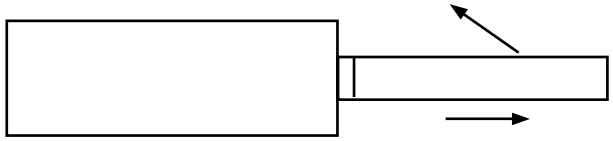
1. The motor will run during the time while the ANGLE +/- key is being pressed and held.)
2. Two motors of the longitudinal direction drive motor and angle control motor work to drive the movements.
3. Analog potential being generated from the angle encoder will be detected to find out the angular movements and positions. Meanwhile, horizontal intermediate position detections will not be made.
4. When the operation is started after resetting, the system goes into the storage stage once, before proceeding to the discharging movement to be started up.
5. Angular adjustments can be performed by use of the angle adjusting keys.
6. By pressing the “OPEN” key once again (or by ACC OFF (While the automatic open-close setting is being turned “ON”)), the system starts storage movement.

● Discharging operations

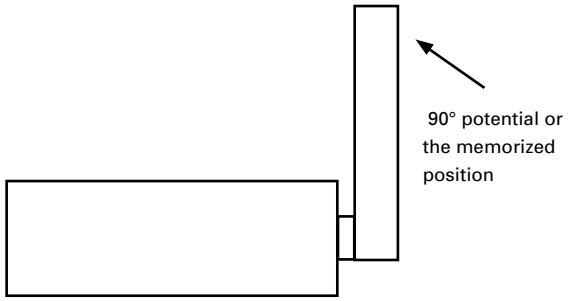
1. When the OPEN key or the ACC is turned "ON"(or detach grille installing), (2 sec. after) the position motor will be activated under the high speed mode.



2. When the longitudinal position sensing switch (PUSH SW)/(LIFT SW) turns H - L, the position motor will be stopped and, at the same time, the angle motor will be activated at high speed.

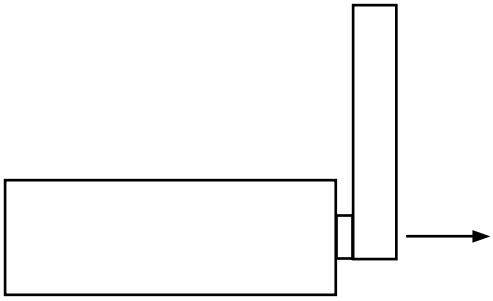


3. When the electric potential of the angle encoder reaches 90° (Reference 0° potential + 3.047V), the angle motor will be stopped. (Braking mode) However, if the preceding angle is being memorized, the angle motor will keep running until the memorized angle can be obtained.

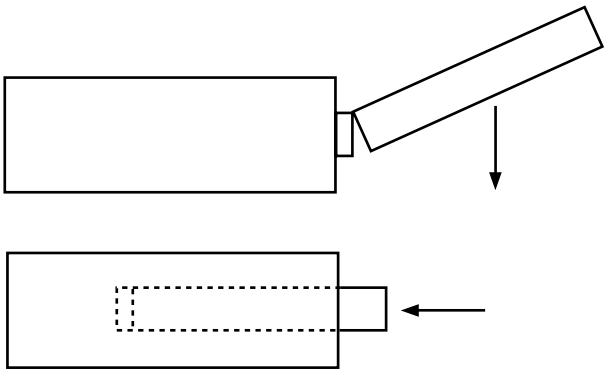


● Storage operation

1. When the CLOSE key is operated (or 6 sec. after turning "OFF" the ACC while the automatic open-close setting is being turned "ON"), the angle motor will be activated at low speed.



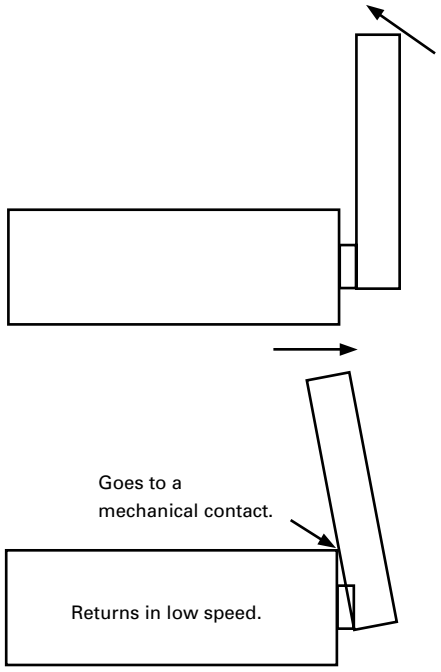
2. At 750ms after the angle 0° potential has been reached, the angle motor will be stopped and the position motor will be activated at high speed. The system will go into stopping movement at the point where the PULL SW is turned "ON" by detection or when the error time is over.



● Angle adjustment

1. For example, from the initial position (about 90°), when the UP key is pressed, the position motor will be activated at high speed for the time during the UP key is being pressed and held. When the UP key has been released, or when a second has passed after the hard-stopper is activated, the system will go under the braking mode.

   The system will operate similarly when making DOWN movements. The lower end of the DOWN movements is at 60° and the system will go under the braking mode when the prescribed potential is exceeded or when the DOWN key is released.



Note:

Position motor : The motor which works to drive the display in the longitudinal direction.

Angle motor : The motor which works to raise or lower (angular direction movements) the display.

● Precautions

1. The angular position will be kept updated while the angle adjusting key is being pressed and held and the last angle will be memorized.
2. When the angular potential does not change toward the expected direction, the system deems it a functional failure to stop the movement at the position.

● Movements of the driving sections under preset modes

Mode settings
Automatic open-close setting : ON
Setback : OFF

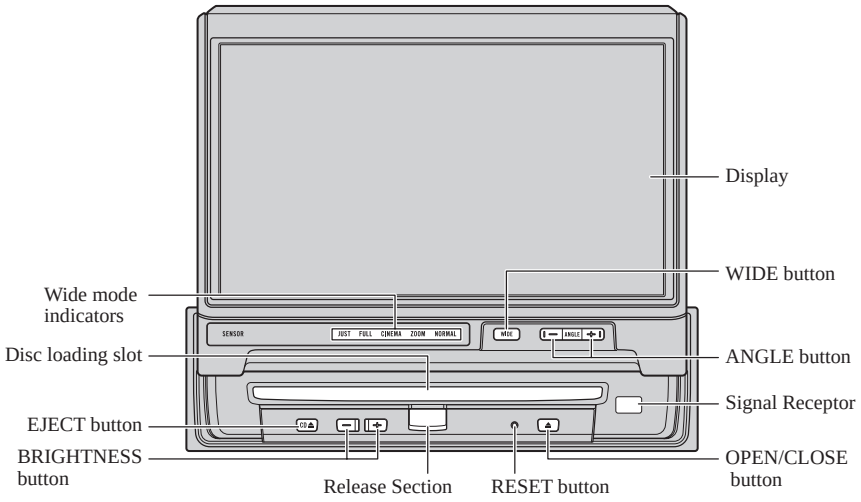
ACC operation mode	While in OPEN state	During OPEN movements	During CLOSE movements	While in CLOSE state
	Or, while the ACC is being turned "OFF"	Or, while the ACC is being turned "OFF"	Or, while the ACC is being turned "OFF"	Or, while the ACC is being turned "OFF"
ACC OFF → ON	OPEN state ↓ Maintains the OPEN state.	–	–	CLOSE state ↓ OPEN movements ↓ Starts reverse movement.
ACC ON → OFF	OPEN state ↓ CLOSE	OPEN movements will continue ↓ OPEN movements will continue ↓ CLOSE	CLOSE movements will continue ↓ CLOSE	CLOSE state ↓ Maintains the CLOSE state.
Last memory	OPEN	OPEN	CLOSE	CLOSE

Mode settings
Automatic open-close setting : OFF
Setback : OFF

ACC operation mode	While in OPEN state	During OPEN movements	During CLOSE movements	While in CLOSE state
	Or, while the ACC is being turned "OFF"	Or, while the ACC is being turned "OFF"	Or, while the ACC is being turned "OFF"	Or, while the ACC is being turned "OFF"
ACC OFF → ON	OPEN state ↓ Maintains the OPEN state.	–	–	CLOSE state ↓ Maintains the CLOSE state.
ACC ON → OFF	OPEN state ↓ Maintains the OPEN state.	OPEN movements will continue	CLOSE movements will continue ↓ CLOSE	CLOSE state ↓ Maintains the CLOSE state.
Last memory	OPEN	OPEN	CLOSE	CLOSE

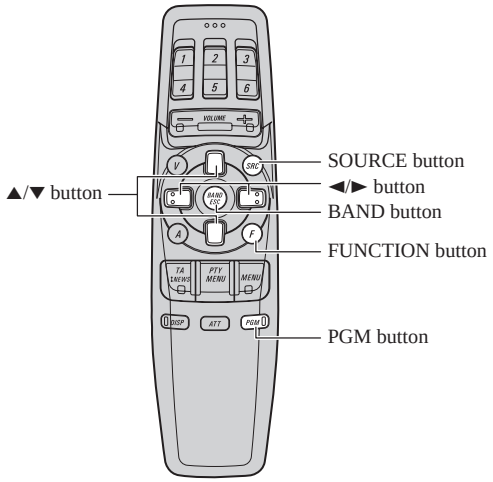
This Product

The following diagram shows the display when it is deployed.

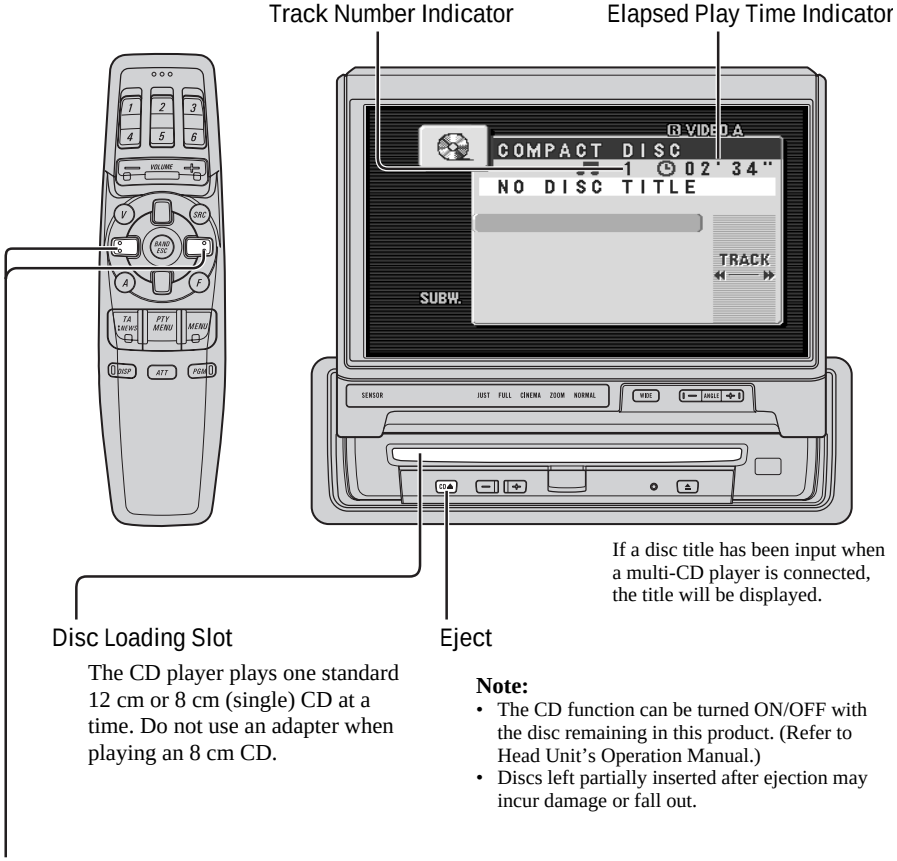


Note:
- Use the remote control products for the AUDIO VISUAL MASTER UNIT by pointing them at this product's signal receptor.

Remote Controller (e.g. AVM-P7000R)



Basic Operation of the CD Player



If a disc title has been input when a multi-CD player is connected, the title will be displayed.

The CD player plays one standard 12 cm or 8 cm (single) CD at a time. Do not use an adapter when playing an 8 cm CD.

Note:
- The CD function can be turned ON/OFF with the disc remaining in this product. (Refer to Head Unit's Operation Manual.)
- Discs left partially inserted after ejection may incur damage or fall out.

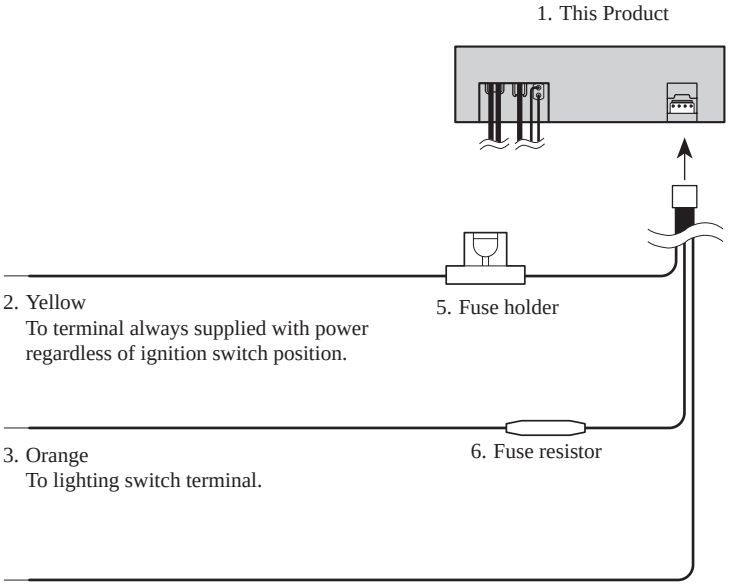
Track Search and Fast Forward/Reverse

- **You can select between Track Search or Fast forward/Reverse by pressing the ◄/► button for a different length of time.**

Track Search	0.5 seconds or less
Fast forward/Reverse	Continue pressing

Note:
- If a disc cannot be inserted fully or playback fails, make sure the recorded side is down. Push the EJECT button and check the disc for damage before reinserting it.
- If a CD is inserted with the recorded side up, it will be ejected automatically after a few moments.

● CONNECTION DIAGRAM



Connecting the Power Cord

1. This Product
2. Yellow
   To terminal always supplied with power regardless of ignition switch position.
3. Orange
   To lighting switch terminal.
4. Black (ground)
   To vehicle (metal) body.
5. Fuse holder
6. Fuse resistor

8.2 SPECIFICATIONS

General

Power source ..... 14.4 V DC (10.8 – 15.1 V allowable)
Grounding system ..... Negative type
Max. current consumption ..... 3.0 A
Dimensions
(DIN)
(mounting size) ..... 178 (W) × 50 (H) × 160 (D) mm
(front face) ..... 188 (W) × 58 (H) × 27 (D) mm
(D)
(mounting size) ..... 178 (W) × 50 (H) × 165 (D) mm
(front face) ..... 170 (W) × 46 (H) × 22 (D) mm
(max. salient dimension) ..... 170 mm
(display) ..... 170 (W) × 129 (H) × 18 (D) mm
Weight ..... 2.2 kg

Display

Screen size/Aspect ratio ..... 7 inch wide/16:9
(effective display area: 154 × 87 mm)
Pixels ..... 336,960 (1,440 × 234)
Type ..... TFT active matrix, transmissive type
Color system ..... NTSC/PAL/SECAM Compatible
Operating temperature range ..... –20 to +60°C
Storage temperature range ..... –40 to +85°C
Angle Adjustment ..... 60 — 110°
Initial setting angle: 90°

CD player

System ..... Compact disc audio system
Usable discs ..... Compact disc
Signal format ..... Sampling frequency: 44.1 kHz
Number of quantization bits: 16; linear
Frequency characteristics ..... 5 – 20,000 Hz (±1 dB)
Signal-to-noise ratio ..... 96 dB (1 kHz) (IEC-A network)
Dynamic range ..... 94 dB (1 kHz)
Number of channel ..... 2 (stereo)

Note:

- Specifications and the design are subject to possible modification without notice due to improvements.

PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
CRT2216

CD MECHANISM MODULE

CX-680

- **This Service Manual outlines operations of the CD mechanism module used in the models listed blow.**
- **For repair, use this Service Manual and the Service Manual of the model used in the system.**

Model	Service manual	CD mechanism module	CD mechanism unit
DEX-P1R/UC DEH-P946/ES DEX-P1/ES	CRT2206	CXK5101	CXB1699
DEH-P945R/EW DEX-P99R/EW	CRT2207	CXK5101	CXB1699

CONTENTS

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS SERVICE INC. P.O.Box 1760, Long Beach, CA 90801-1760 U.S.A.
PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE.LTD. 501 Orchard Road, #10-00, Lane Wheelock Place, Singapore 238880

K-FES. MAY. 1998 Printed in Japan

1. CIRCUIT DESCRIPTIONS

1.1 Preamplifier (UPC2572GS: IC101)

The preamplifier processes pickup output signals to generate signals to be sent to the servo, demodulator, and controller. The preamplifier with built-in photodetector converts signals from the pickup into intermediate voltage in the pickup. Then, addition is made in the RF amplifier (IC101) to obtain RF, FE, TE, and TE zero cross signals. The system consists of the UPC2572GS and other components explained below. The system uses a single power source (+5 V). Therefore, the reference voltage of IC101 and the reference voltage of the power unit and servo circuit are REFO (+2.5 V). REFO is obtained from REFOUT of servo LSI (IC201: UPD63702GF) via a buffer, and is output from Pin 19 of IC101. This REFO is used as reference for all measurements.

Note: Do NOT short-circuit REFO and GND during measurement.

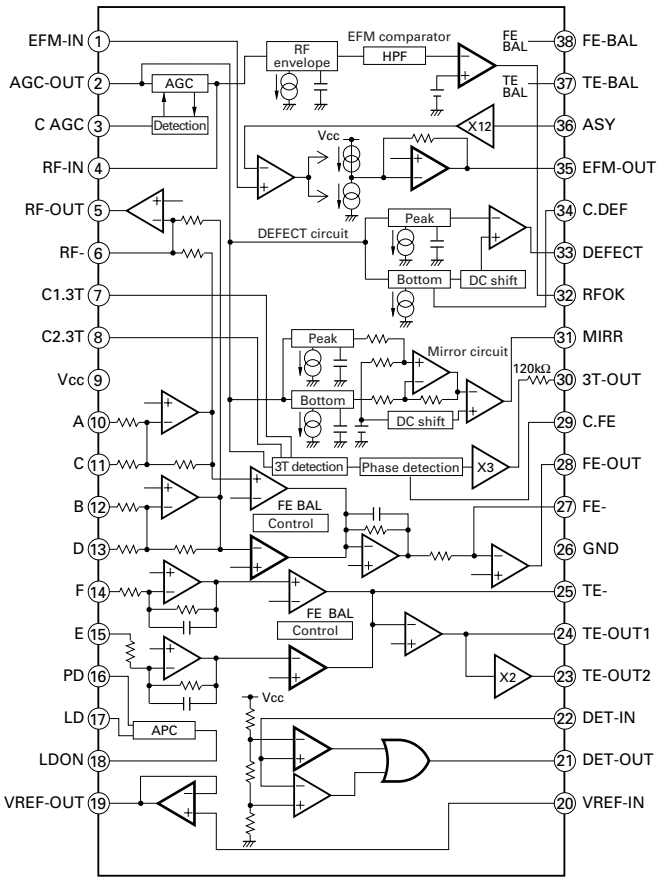


Fig. 1 Block Diagram of UPC2572GS

1) Automatic Power Control (APC) circuit

Laser diode has negative temperature characteristics with great optical output when the diode is driven with constant current. Therefore, current must be controlled by a monitor diode to ensure constant output. Thus functions the APC circuit. LD current can be obtained by measuring the voltage between LD1 and GND. The current value is approximately 35 mA.

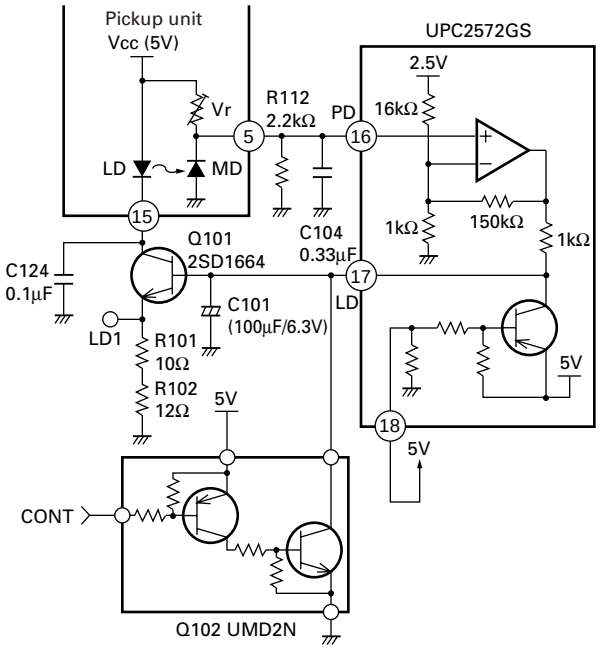


Fig. 2 APC Circuit

2) RF amplifier and RF AGC amplifier

Photodetector outputs (A+C and B+D) are added, amplified and equalized in IC101, and output to the RFI terminal as RF signal. (Eye pattern can be checked at this terminal.)

Low-frequency components of voltage RFI is:

RFI = (A + B + C + D) x 3.22

where R111 is offset resistor to keep RFI signal within the output range of the preamplifier. RFI signal is goes under AC coupling, and is input to Pin 4 (RFIN terminal).

IC101 contains an RF AGC circuit. RFO output from Pin 2 is maintained to a constant level (1.2 ±0.2 Vp-p). The RFO signal is used in the EFM, DFCT, and MIRR circuits.

3) EFM circuit

The EFM circuit converts RF signal into digital signals of "0" and "1." RFO signal after AC coupling is input to Pin 1, and supplied to the EFM circuit.

Asymmetry caused during manufacturing of discs cannot be eliminated solely by AC coupling. Therefore, the system controls the reference voltage ASY of the EFM comparator by using the fact that probability to generate "0" and "1" is 50% in EFM signal. This reference voltage ASY is generated by output from the EFM comparator through L.P.F. EFM signal is output from Pin 35. As signal level, amplification is 2.5 Vp-p around REFO.

4) DFCT (defect) circuit

DFCT signal detects mirror defect in discs, and is output from Pin 33. The system outputs "H" when a mirror defect is detected.

If disc is soiled, the system determines it as lack of mirror. Therefore, the system inputs the DFCT signal output to the HOLD terminal of servo LSI. Focus and tracking servo drives change to Hold status only when DFCT output is in "H" so that performance of the system upon detection of defect can be improved.

5) RFOK circuit

The RFOK circuit outputs signal to show the timing of focus closing servo, as well as the status of focus closing during playback. The signal is output from Pin 32. The system inputs the RFOK signal output to the RFOK terminal of servo LSI. The servo LSI issues Focus Close command. The system outputs signal in "H" during focus closing and playback.

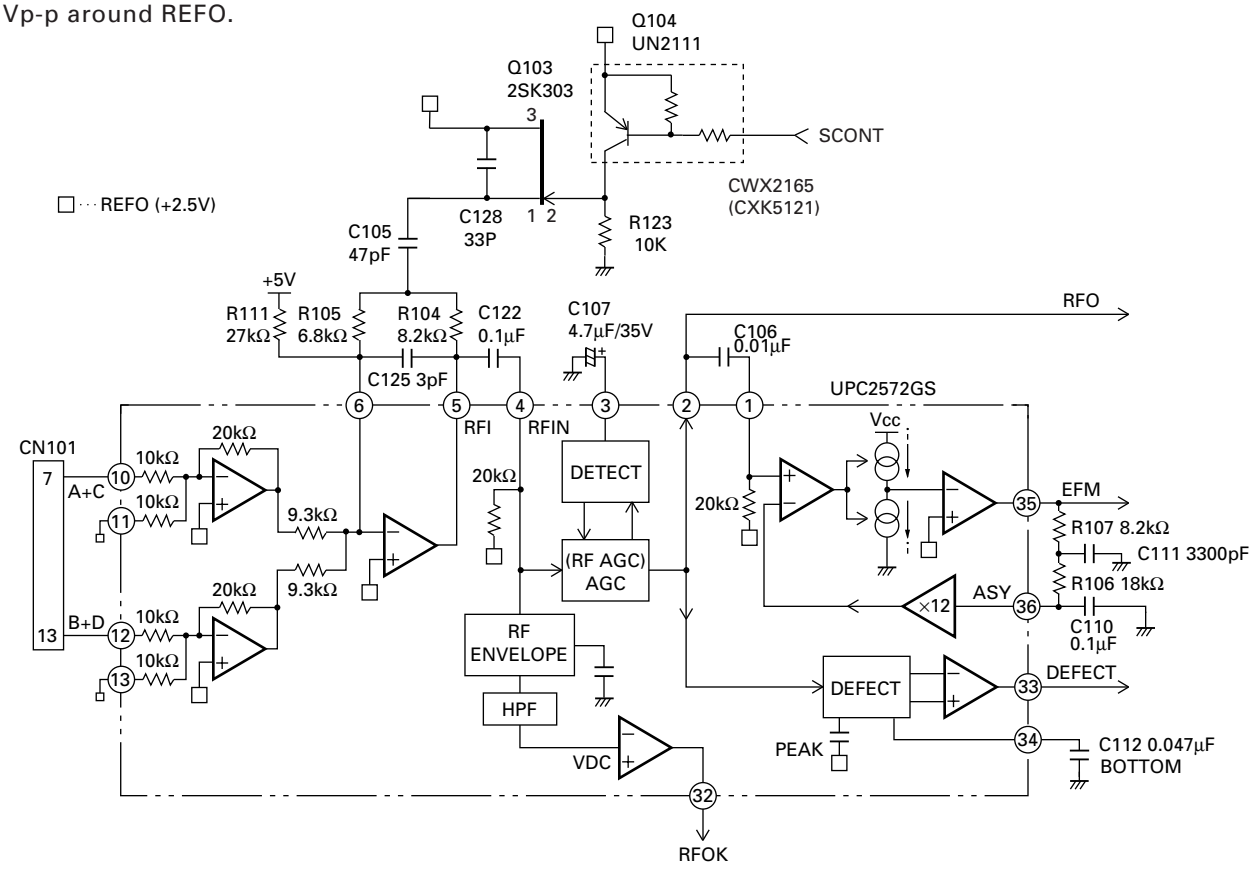


Fig. 3 RF AMP, RF AGC, EFM, DFCT, RFOK Circuit

6) Focus-error amplifier

The system outputs photodetector output (A+C and B+D) as FE signal (A+C-B-D) from Pin 28 via the difference amplifier, then via the error amplifier.

Low-frequency components of voltage FEY is:

$$FEY=(A+C-B-D)X\ \frac{20k\Omega}{10k\Omega}\ X\ \frac{90k\Omega}{68.8k\Omega}\ X\ \frac{R108}{17.2k\Omega}$$

: (FE level of pickup unit x 5.02)

An S curve equivalent to approximately 1.6 Vp-p is obtained at FE output (Pin 28) by using REFO as reference. The cut-off frequency of the amplifier of the last layer is 12.4 kHz.

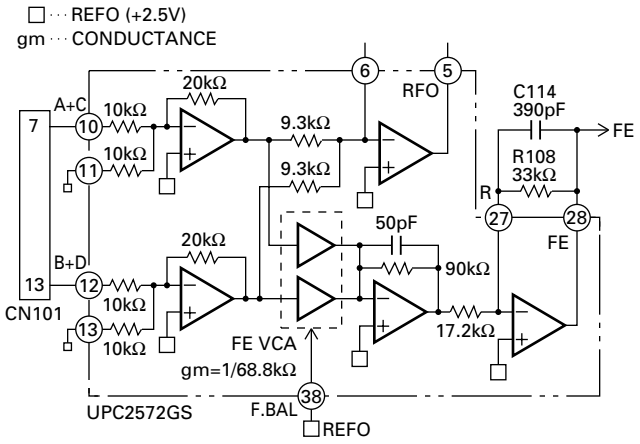


Fig. 4 Focus-error amplifier

7) Tracking-error amplifier

Outputs E and F from the photodetector are output as TE signal (E-F) from Pin 24 via the difference amplifier, then via the error amplifier.

Low-frequency components of voltage TEY is:

$$TEY=(E-F)\ X\ \frac{63k\Omega}{31k\Omega+16k\Omega}\ X\ \frac{R109}{17k\Omega}$$

: (TE level of pickup unit x 5.36)

TE waveforms equivalent to approximately 1.5 Vp-p are obtained at TE output (Pin 24) by using REFO as reference. The cut-off frequency of the amplifier of the last layer is 19.5 kHz.

8) Tracking zero-cross amplifier

Tracking zero-cross signal (TEC signal) is generated by amplifying TE waveforms (voltage at Pin 24) by a factor of four. The signal is used for detecting the zero-cross point of tracking error in the servo LSI UPD63702GF. The purposes of detecting the zero-cross point are as follows:

(1) To be used for counting tracks for carriage move and track jump.

(2) To be used for detecting the direction of lens movement when tracking is closed. (To be used in the tracking brake circuit mentioned later.)
The frequency range of TEC signal is from 500 Hz to 19.5 kHz.
Voltage TEC = TE level x 4

In other words, the TEC signal level is calculated as 6 Vp-p. This level exceeds the D range of the operation amplifier, resulting in the signal to clip. However, there shall be no problem, since the servo LSI uses only zero-cross point.

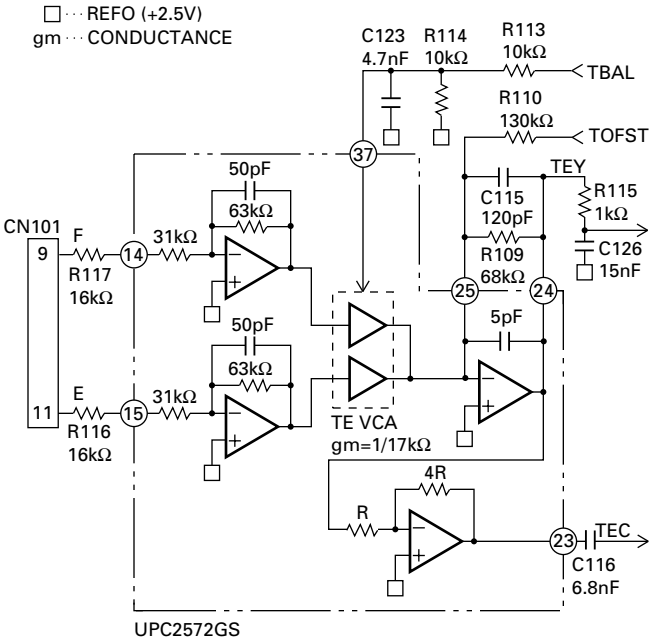


Fig. 5 Tracking-error amplifier,
Tracking zero-cross amplifier

9) MIRR (mirror) circuit

MIRR signal shows ON and OFF track information. The signal is output from Pin 31.

The status of MIRR signal is as follows:

Laser beam ON track: MIRR = "L"

Laser beam OFF track: MIRR = "H"

The signal is used in the brake circuit mentioned later.

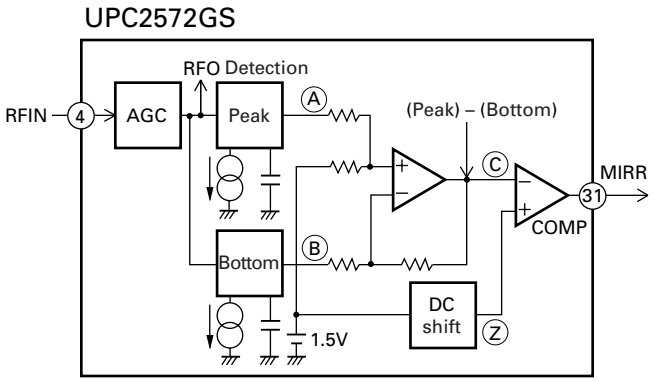


Fig.6 MIRR Circuit

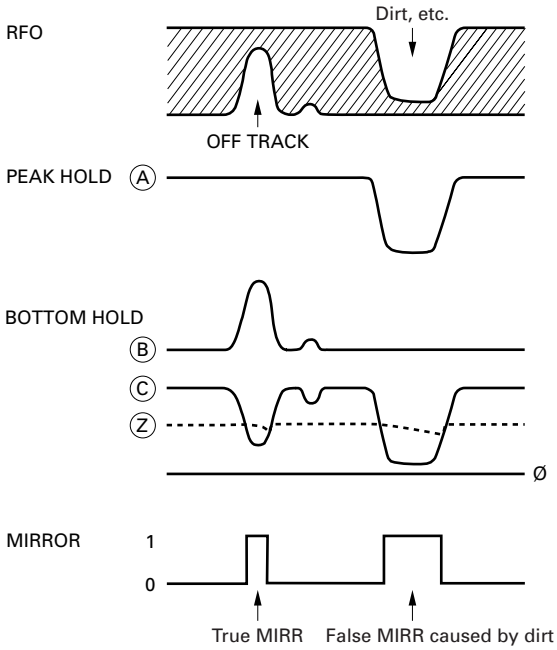


Fig. 7 MIRR Circuit

10) 3T OUT circuit

The system detects flickering of RF signal when disturbance is input to the focus servo loop, and outputs the difference of phase between FE signal and RF-level fluctuation signal from Pin 30. The resulting signal is obtained through L.P.F. with a fc of 40 Hz. This signal is used for automatic adjustment of FE bias.

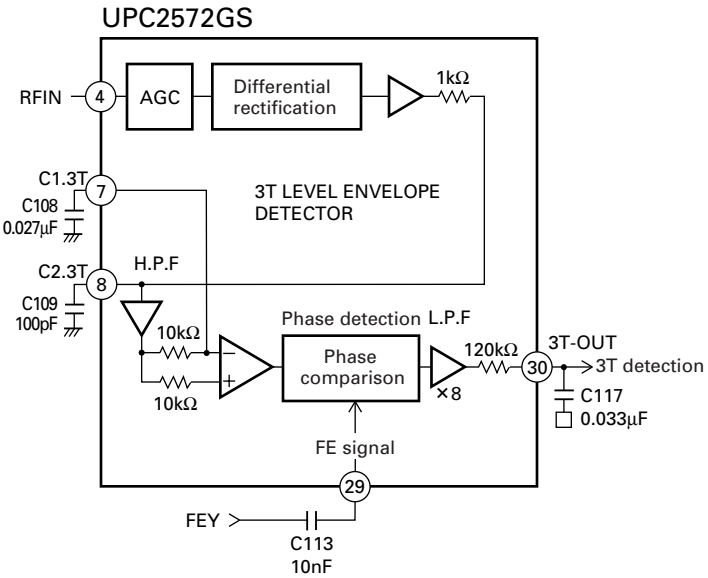


Fig. 8 3T OUT Circuit

1.2 Servo (UPD63702AGF: IC201)

The servo consists of mainly two parts. The first part is the servo processing unit to equalize error signals and control track jump, carriage move, in focus, etc. The second part is the signal processing unit to perform data decoding, error correction, and interpolation.

The system converts FE and TE signals from analog to digital in IC201, then outputs drive signals of the focus, tracking, and carriage systems via the servo block. The EFM signal input from the preamplifier is decoded by the signal processing unit, and eventually output as audio signal after conversion into analog from digital signals via the DA converter (IC201 contains audio DAC). Then, the system generates error signal for the spindle servo in the decoding process, sends the signal to the spindle servo to generate drive signal for spindle.

After that, drive signals for focus, tracking, carriage, and spindle are amplified in IC301 and BA6797FM, and supplied to respective actuators and motors.

1) Focus servo system

The main equalizer of focus servo is located in the UPD63702AGF. Fig. 9 shows block diagram of the focus servo.

For the focus servo system, the lens must be positioned within the focusing range in order to perform focus closing. To achieve this, the system moves the lens upward/downward by focus-search voltage of triangular waveform to detect the focusing point. During searching, the system kicks the SPDL motor to maintain rotation speed to set speed.

The servo LSI monitors FE and RFOK signals so that focus closing is performed automatically at an appropriate point.

Focus closing is performed when the following four conditions are satisfied:

(1) When the lens moves nearer to the disc.
(2) RFOK = “H”
(3) FZD signal (in IC) is latched to “H.”
(4) FE = 0 (REFO as reference)

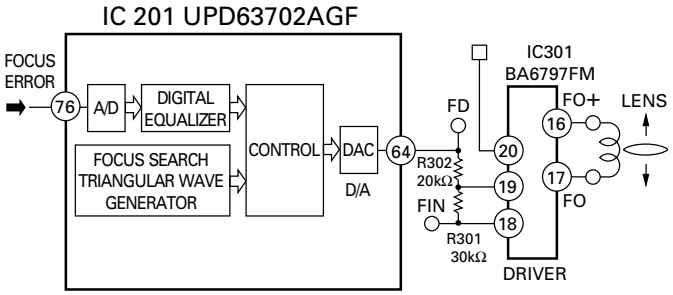


Fig. 9 Focus servo block diagram

When the conditions mentioned above are satisfied and focus is closed, the XSO terminal changes from "H" to "L." Then, the microcomputer starts monitoring RFOK signal through L.P.F after 40 ms.
If the system judges RFOK signal as "L," the microcomputer takes actions, including protection.
Fig. 10 shows operations related to focus closing. (The illustration shows when the system cannot perform focus closing.) S curve, search voltage, and actual lens behavior can be checked by pressing the Focus Close button when "01" is shown in Focus Mode Select in Test mode.

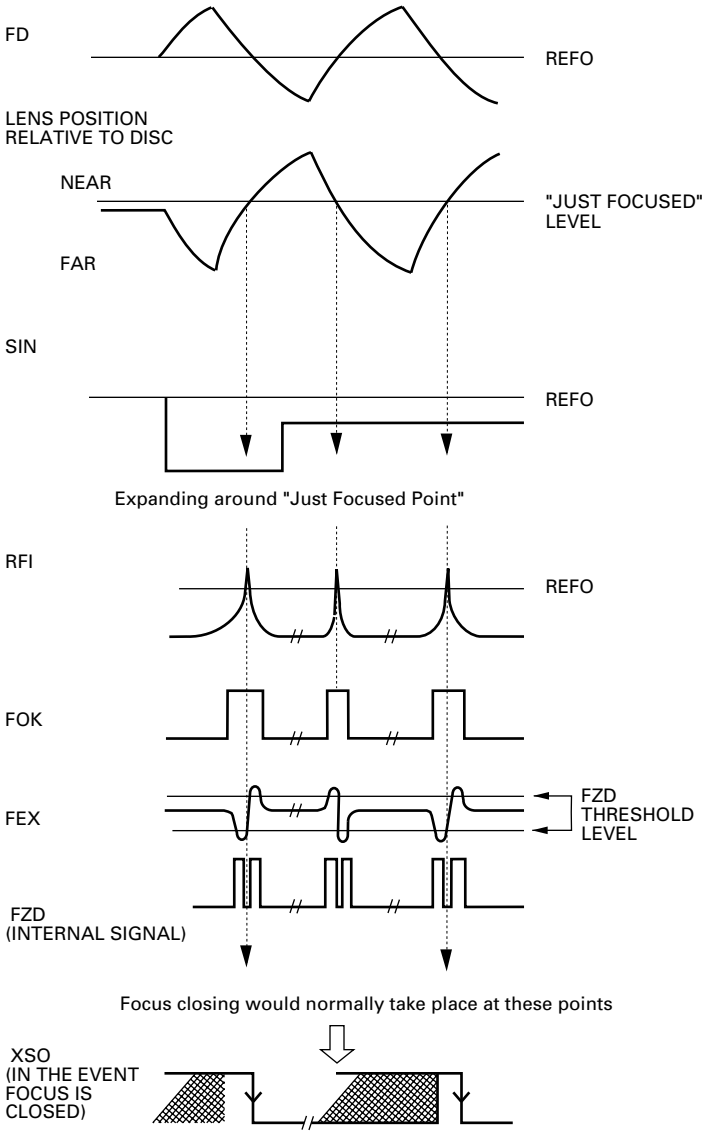


Fig. 10 Sequence of Focus Closing

2) Tracking servo system

The main equalizer of tracking servo is located in the UPD63702AGF. Fig. 11 shows block diagram of the tracking servo.

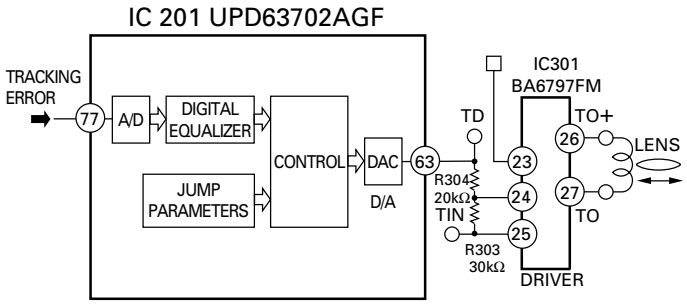


Fig. 11 Tracking servo block diagram

a) Track jump

Track jump is automatically performed by the auto sequence function in LSI when the LSI accepts command. The system has six types of jump (1, 4, 10, 32, 32x2, and 32x3) for truck jump during searching. In Test mode, the system can select and check these jump types and CRG move by selecting a mode. The microcomputer sets half of the total number of track jumps (two tracks if the total number of tracks are four), and counts the set number of tracks by using TEC signal. The system outputs brake pulse for a specified time (set by the microcomputer) from the point of time when the set number is counted, and stops the lens. Thus, tracking is closed, and the system can continue normal playback.

To improve servo withdrawal during track jump, the system sets the brake circuit to ON for 60 ms after brake pulse so that gain of the tracking servo can be increased.

FF/REV in normal mode is made by continuously performing single jump approximately ten times faster than in normal playback.

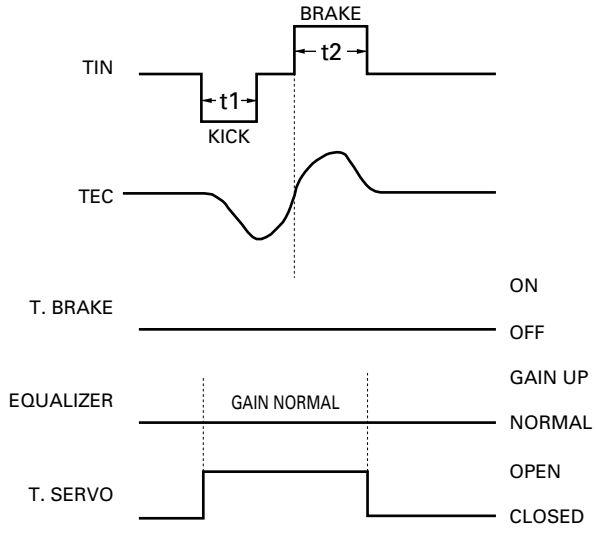


Fig. 12 Single track jump

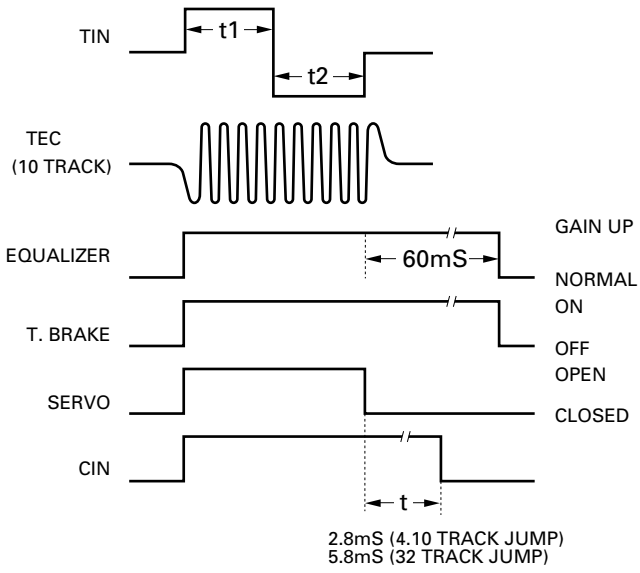


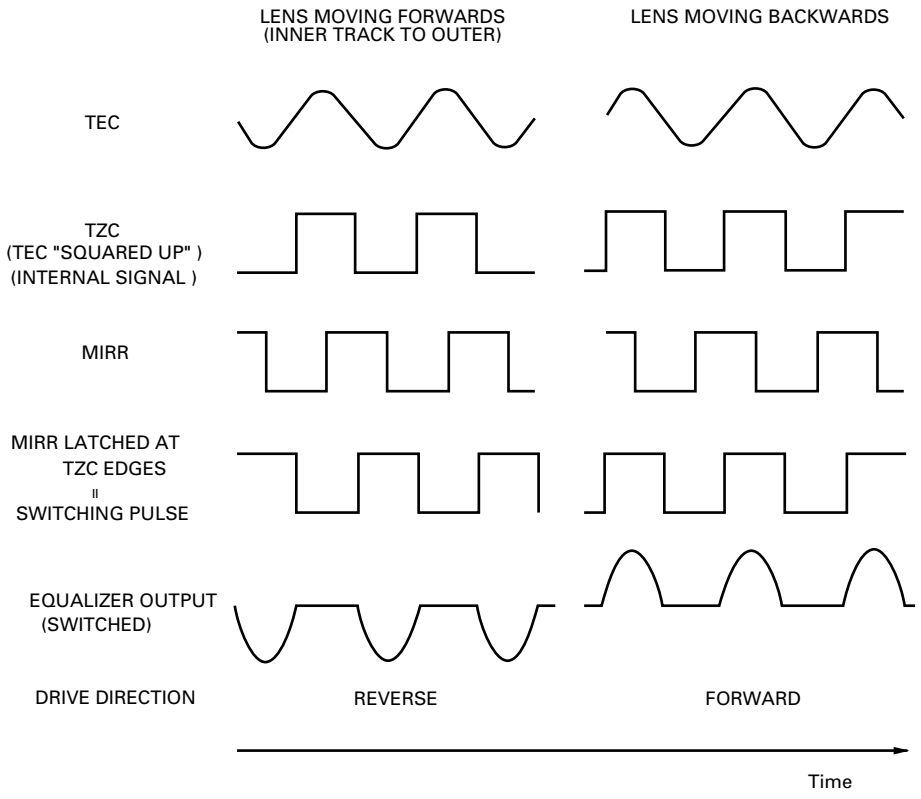
Fig. 13 Multi track jump

b) Brake circuit

Servo withdrawal will deteriorate during setting and track jump. Thus, the system uses the brake circuit to provide stable withdrawal to servo loop.

The brake circuit detects the direction of lens movement, and outputs only drive signal in the opposite direction from the lens movement. Thus, the system delays the speed of the lens movement to stabilize withdrawal of the tracking servo.

The system judges sliding direction of track from TEC and MIRR signals, as well as the relationship of their phase.



Note: In the illustration, the phase of equalizer output is shown as the same as with that of TEC.

Fig. 14 Tracking Brake Circuit

3) Carriage servo system

Output from low-frequency components (lens position information) of the tracking equalizer is input to the carriage equalizer by the carriage servo. After obtaining a certain gain, the system outputs drive signal from the servo LSI. The signal is then applied to the carriage motor via the driver IC. More specifically, the pickup unit as a whole must be moved forward when lens offset during playback reaches a specified level. Therefore, gain of equalizer is set so that voltage higher than the activation voltage of the carriage motor is output. As actual operation, a certain threshold level is set for equalizer output in the servo LSI, and drive voltage is output from the servo LSI only when the equalizer output level exceeds that level. Thus, power consumption is reduced. Depending on eccentricity, etc. of disc, the equalizer output voltage may cross the threshold level several times before the pickup unit as a whole starts operation. At this time, waveforms of drive voltage from LSI are output as pulse.

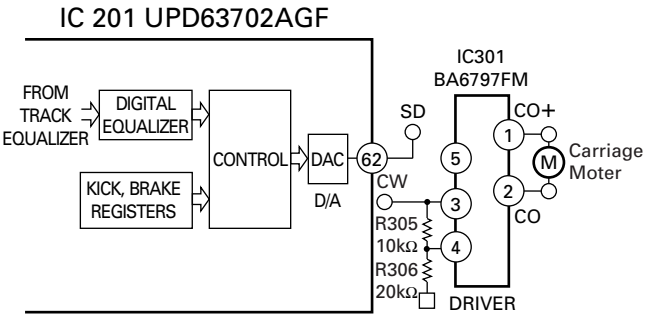


Fig. 15 Carriage Servo Circuit

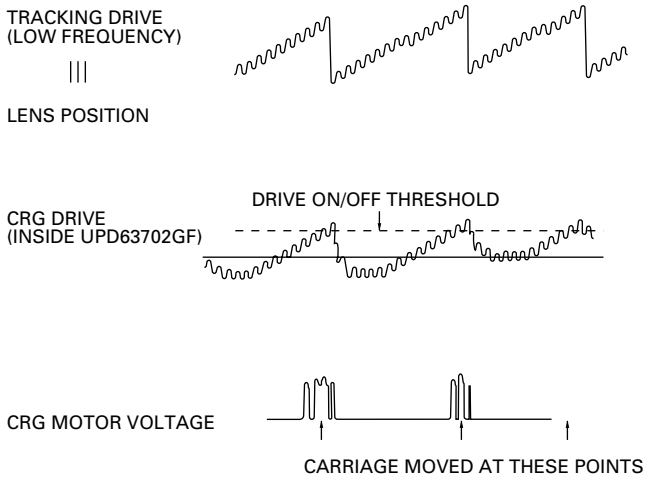


Fig. 16 Carriage Signal Waveforms

4) Spindle servo system

The spindle servo has the following modes:

(1) Kick mode: To be used for accelerating disc rotation during setting.

(2) Offset mode:

a) To be used after completion of kick until completion of spindle lock during setting.

b) If focus is out of range during playback, this mode is used until focus is recovered. In both cases, Offset mode is used for maintaining disc rotation to the speed close to specified rotation.

(3) Adaptive Servo mode: CLV servo mode during normal operation. The system samples every WFCK in 16 cycles whether frame synchronous signal matches output from the internal frame counter in EFM demodulation block, and generates signal that shows matching/unmatching status. If signal showing unmatching status continues for 8 times, the system deems it as asynchronous status. Except this case, the system judges as synchronous. In Adaptive Servo mode, the system automatically selects withdrawal servo for asynchronous status, and steady-state servo for synchronous status.

(4) Brake mode: Mode to stop the spindle motor. The microcomputer outputs brake voltage from the servo LSI. Waveforms of EFM are monitored inside the LSI. If the longest pattern of EFM exceeds specified intervals (if the rotation speed adequately slowed down), flag is activated in the LSI, and the microcomputer turns brake voltage to OFF. If no flag is activated after a specified time, the microcomputer changes from Brake to Stop mode. This status continues for a specified time. If the system changes to Stop mode during ejection, disc is ejected after the specified time mentioned above.

(5) Stop mode: To be used when the power is turned to ON, and during ejection. In Stop mode, the end-to-end voltage of the spindle motor is 0 V.

(6) Rough Servo mode: To be used when returning carriage (carriage move during long search, etc.). The system calculates linear speed from waveforms of EFM, and inputs either “H” or “L” level to the spindle equalizer. This mode is also used for confirmation of grating in Test mode.

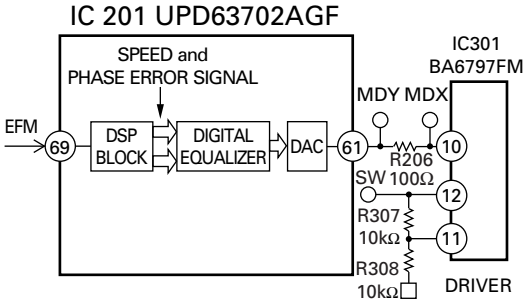


Fig. 17 Spindle servo block diagram

1.3 Automatic Adjustment Function

With this system, all circuit adjustments are automatically performed by using the preamplifier (UPC2572GS) and servo LSI (UPD63702AGF). All adjustments are automatically performed whenever disc is inserted or CD mode is selected by the Source key. Details of automatic adjustments are as follows:

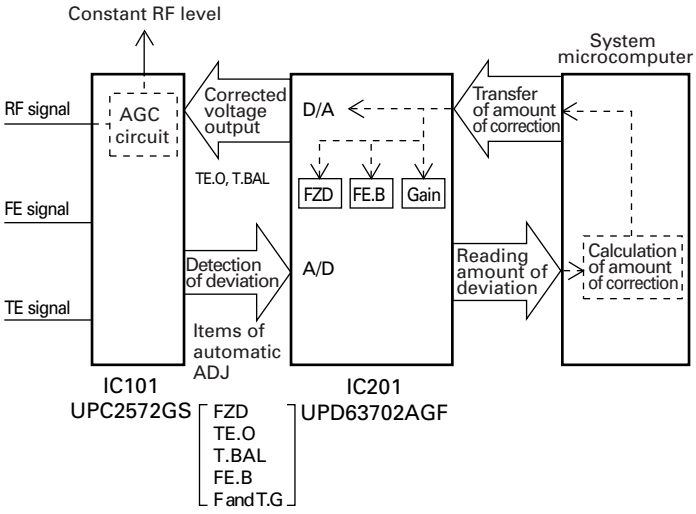


Fig. 18 Outline of Automatic Adjustment

1) Setting of FZD cancellation

This setting ensures focus closing. The system reads the FE offset level when the power is turned to ON, then writes the inverse voltage of offset value of that level to CRAM inside IC to cancel offset. Thus, the threshold level of FZD can be set to a constant value (+150 mV). As a result, "Latching FZD signal to H," which is one of the conditions required for focus closing in IC, is ensured.

2) TE offset automatic adjustment

Adjusts TE amplifier offset of the preamplifier to 0 V when the power is turned to ON.

Adjustment is made as follows:

(1) The microcomputer reads TE offset in LD OFF status via the servo LSI (TE1).

(2) The microcomputer calculates the voltage to be corrected using the TE1 value, and outputs from Pin 65 (pin name: TOFST) of the servo LSI. More specifically, calculation is made as follows:
TOFST2 = TOFST1 + TE1 x R110 / R109

3) Tracking balance (T.BAL) automatic adjustment

To make the sensitivity of Ech of TE output equal to that of Fch. In fact, adjustment is made so that the upper and lower portions of TE waveforms are symmetric to REFO.

Adjustment is made in the following steps:

(1) After focus close, the system kicks the lens in the radial direction to ensure TE waveforms to be generated.

(2) The microcomputer reads the peak bottom of TE waveforms via the servo LSI.

(3) The microcomputer calculates the amount of offset, then calculates the voltage to be corrected based on that offset. The system outputs the result from Pin 66 (pin name: TBAL) of the servo LSI.

(4) The voltage output from the servo LSI is input to Pin 37 of the preamplifier (IC101: UPC2572GS). Pin 37 is a control-voltage terminal of the TEVCA amplifier. According to voltage input, the system changes gain of Ech and Fch in the preamplifier, and adjusts the tracking balance to make the upper and lower portions of TE waveforms symmetric to REFO.

4) FE bias automatic adjustment

Maximizes the RFI level by optimizing focus point during playback. Adjustment is made by using 3T level waveforms of RF waveforms and the phase difference generated by input of disturbance of focus error. Since adjustment is made by inputting disturbance to focus loop, the system uses the same timing as with auto gain control (mentioned later~) for adjustment.

Adjustment is made in the following steps:

(1) Disturbance is input to focus loop by the command from the microcomputer (inside the servo LSI).

(2) The system detects flickering of 3T components of RF signal in the preamplifier.

(3) The system checks the phase difference between 3T components mentioned above and FE signal caused by input of disturbance to detect the direction of focus deviation. The result is output as DC voltage from Pin 30 (3TOUT) of the preamplifier.

(4) The 3TOUT voltage is input to Pin 75 (A/D port) of the servo LSI. The microcomputer reads this 3TOUT voltage via the servo LSI.

(5) The microcomputer calculates the amount of correction required. The results are transferred to offset of focus loop in the servo LSI.

As with auto gain control, the system repeats the same adjustment process several times to improve adjustment precision.

5) Auto gain control (AGC)

AGC adjustment is already used in the CD modules of the previous generation. This function automatically adjusts servo loop gain of focus and tracking.

Adjustment is made in the following steps:

(1) Disturbance is input to servo loop.

(2) The system extracts error signals (FE and TE) upon input of disturbance via the B.P.F. and obtains signals of G1 and G2.

(3) The microcomputer reads G1 and G2 signals via the servo LSI.

(4) The microcomputer calculates required amount of correction to adjust loop gain in the servo LSI.

The system repeats the same adjustment process several times to improve adjustment precision.

6) Initial adjustment value

For all automatic adjustments, the system uses the previous adjustment value as initial values, except when the power of the microcomputer has been turned to OFF (backup is turned to OFF). If backup has been turned to OFF, the system uses initial set value to perform automatic adjustment.

7) Display of coefficients of adjustment results

Results of automatic adjustments can be displayed in Test mode for confirmation. Display of coefficients in each automatic adjustment is as follows:

(1) FZD cancel, TE.OFST cancel, T.BAL, and FE bias

Reference = 32 (32: No adjustment was required)

Display is made in units of approximately 40 mV.

Example: Coefficient of FZD cancel = 35

35 - 32 = 3 3 x 40 mV = 120 mV

Corrected amount is approximately +120 mV. Thus, FE offset before adjustment is -120 mV.

(2) Adjustment of F and T gain

Reference: Focus = 13, tracking = 20

The amount of reduced gain in comparison with the reference is known by looking at the coefficient displayed.

Example: AGC coefficient = 40

Amount of reduced gain = 20 log (20/40) = -6 dB

1.4 Power Supply and Loading Unit

The power supply of the system uses VD (8.3 V) supplied from the mother board, and generates power supply VM (7.6 V) for the loading motor driver and 5 V RegIC power supply (7.6 V). The system directly uses VD for power supplies for driving voltage of disc detection LED and CD driver IC. The microcomputer controls ON/OFF of the CD driver and laser diode by "CONT," and ON/OFF of 5 V by "CD5VON." The loading motor driver has no control terminal. However, "EJ" and "LOAD," which are input signals, play the same role as with control terminal.

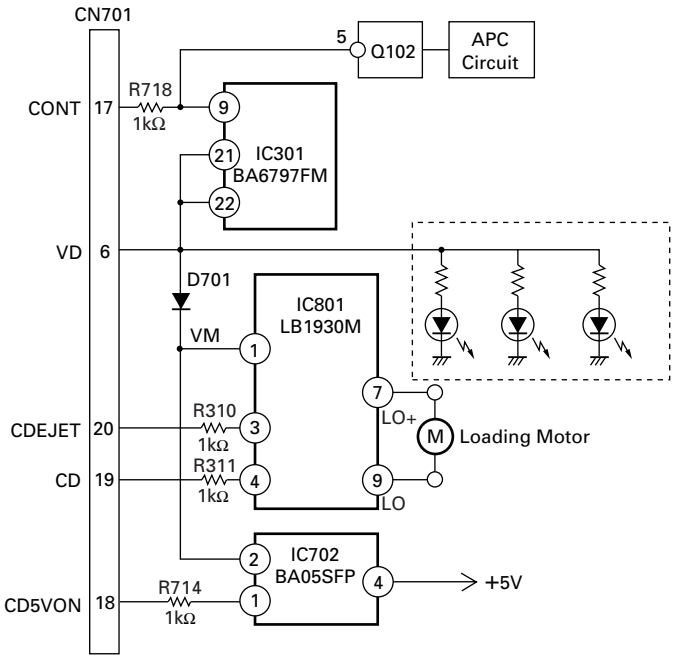


Fig. 19 Power Supply and Loading Unit

2. MECHANISM DESCRIPTIONS

● Disc loading

1. Three phototransistors are provided in front and rear of the rubber roller for disc transfer. Light is received from three LEDs corresponding the phototransistors. (Voltage of the phototransistors is "L" when receiving light.)
2. The voltage of the front phototransistor (P1) changes to "H" when disc is inserted and reaches immediately before the rubber roller. As a result, the loading motor is activated to drive.
3. The driving power of the motor is conveyed by the gear to rotate the rubber roller and transfer the disc. The rubber roller is located at an end of the loading arm, and in condition to lift the guide arm. The guide arm is driven by two springs so that the guide arm and rubber roller obtain appropriate pressure to transfer disc between them.
4. The clamper arm has the disc centering mechanism to determine disc size and clamp the disc to the center of the spindle motor. The centering arms are provided on the right and left of the clamper arm, and move around the supporting point. The end of centering arm has a lock arm (rotates around the centering pin, and is locked to the clamper arm when an 8-cm disc is inserted).
5. The lock arm is unlocked when a 12-cm disc is inserted, and moves to the position shown in Fig. 21. The position of the detection arm, having the center of rotation on the right centering arm as shown in Fig. below, is different for 8-cm and 12-cm discs. The detection arm moves clockwise according to outer diameter when disc is positioned on the spindle to move the detection lever downward as shown in the illustration.

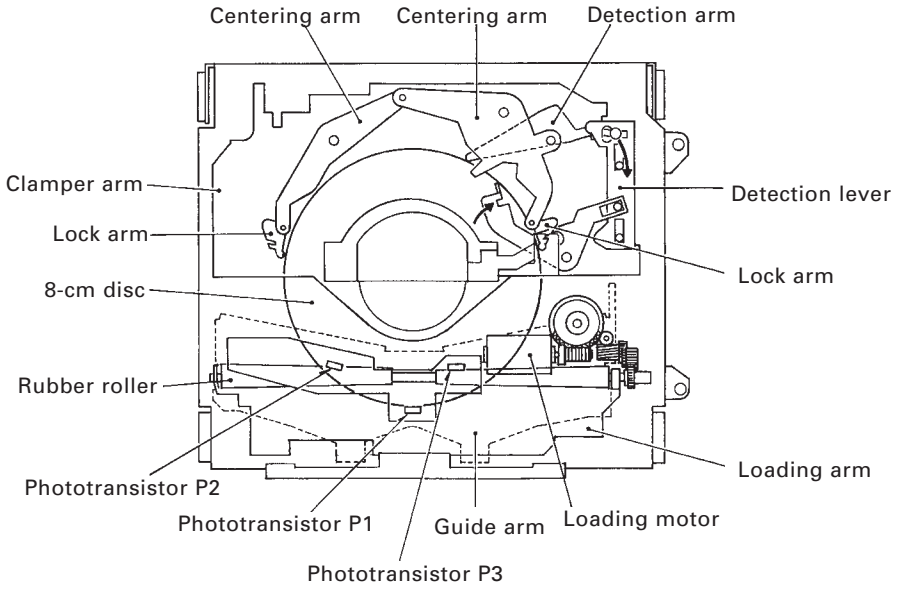
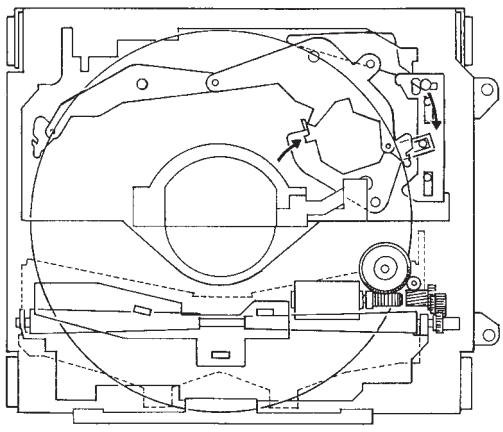


Fig. 20



When 12-cm disc is inserted

Fig. 21

● Clamp operation

When the rack lever in contact with the detection lever is driven by the loading motor, the rack lever engages with the gear to move the clamp UP lever, mechanical lock arm, and mechanical lock lever toward the directions indicated with arrows in Fig. 22.

The clamper arm, that was lifted by the clamp UP lever, comes down to clamp disc. The clamp UP lever and mechanical lock lever L move the loading arm apart from the disc. When the mechanical lock lever has moved to a specified position, the system turns the clamp switch to ON to stop the loading motor.

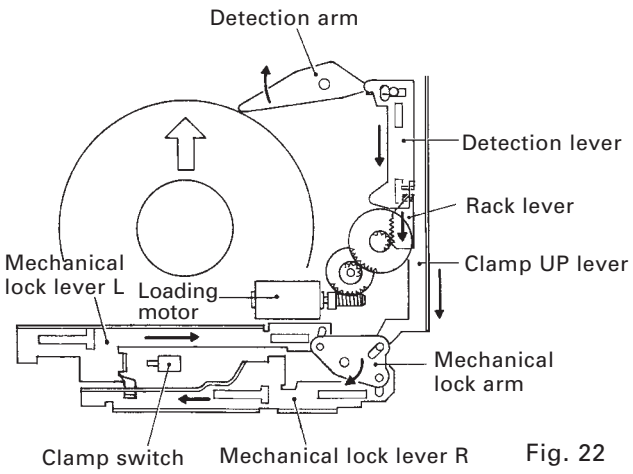


Fig. 22

● Mechanical locking

During ejection, two mechanical lock levers slide into the teeth of the frame to resist the mechanical spring and push down the front of floating (chassis) unit. Thus, the system detects the height of disc insertion. During playback, the floating unit is released when the mechanical lock levers move and disengage from the frame teeth.

● Ejection

Disc is ejected by the loading motor rotating in the inverse direction from loading to activate mechanical locking, release clamping, and press the roller. The system stops the loading motor when both phototransistors P2 and P3 in the rear of the rubber roller detect. (Voltage : L)

3. DISASSEMBLY

When removing the floating unit, stop the mechanism during playback (to unlock the mechanism).

● **Removing the damper and frame**

● **Removing the floating unit**

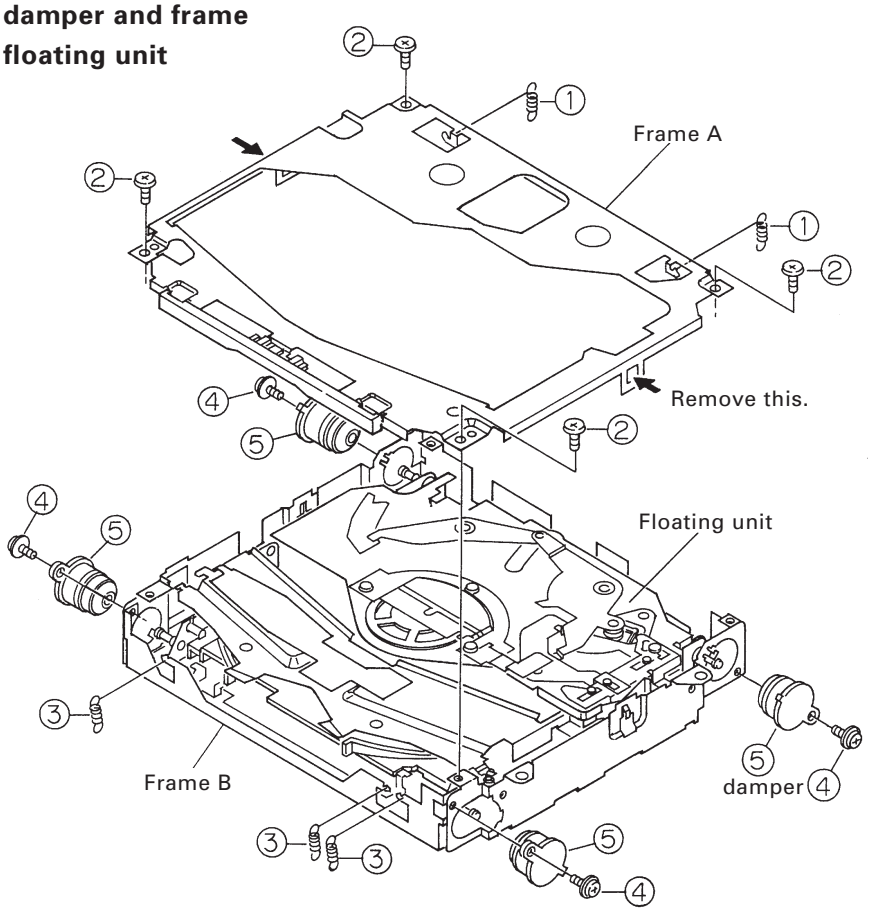


Fig. 23

● **Removing the clamper arm**

● **Removing the spindle motor**

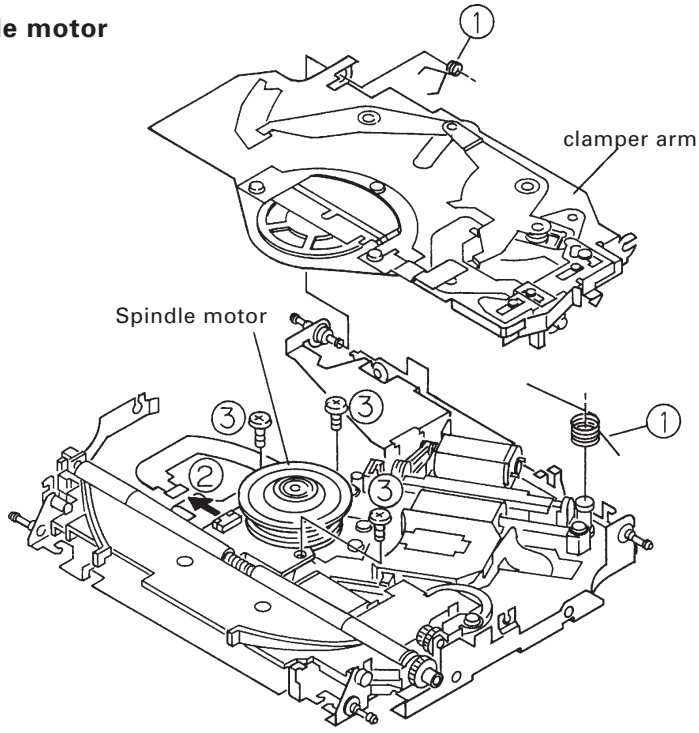


Fig. 24

● Removing the Carriage Motor

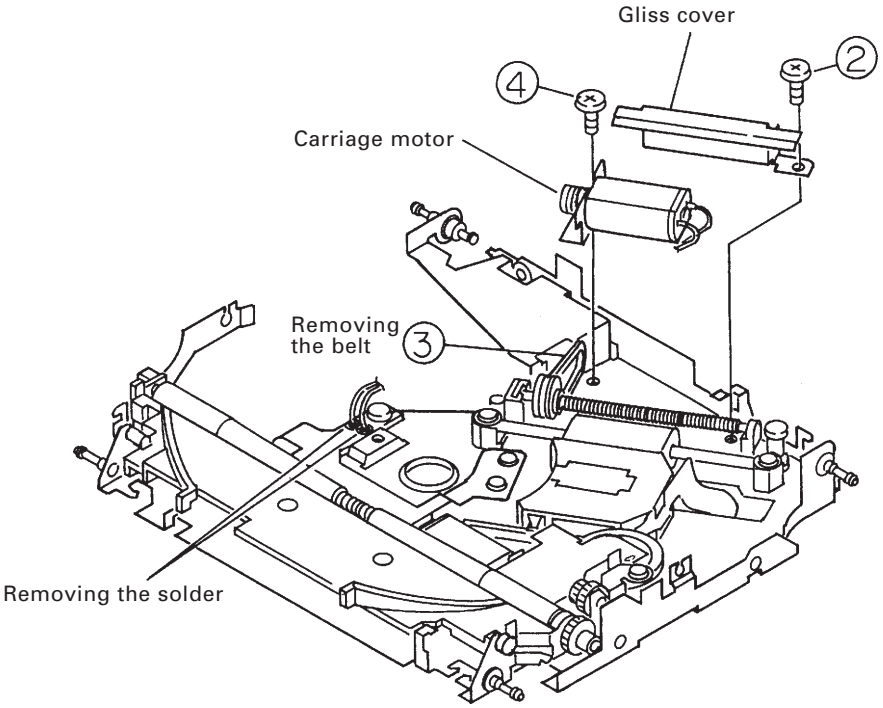


Fig. 25

● Removing the Loading motor

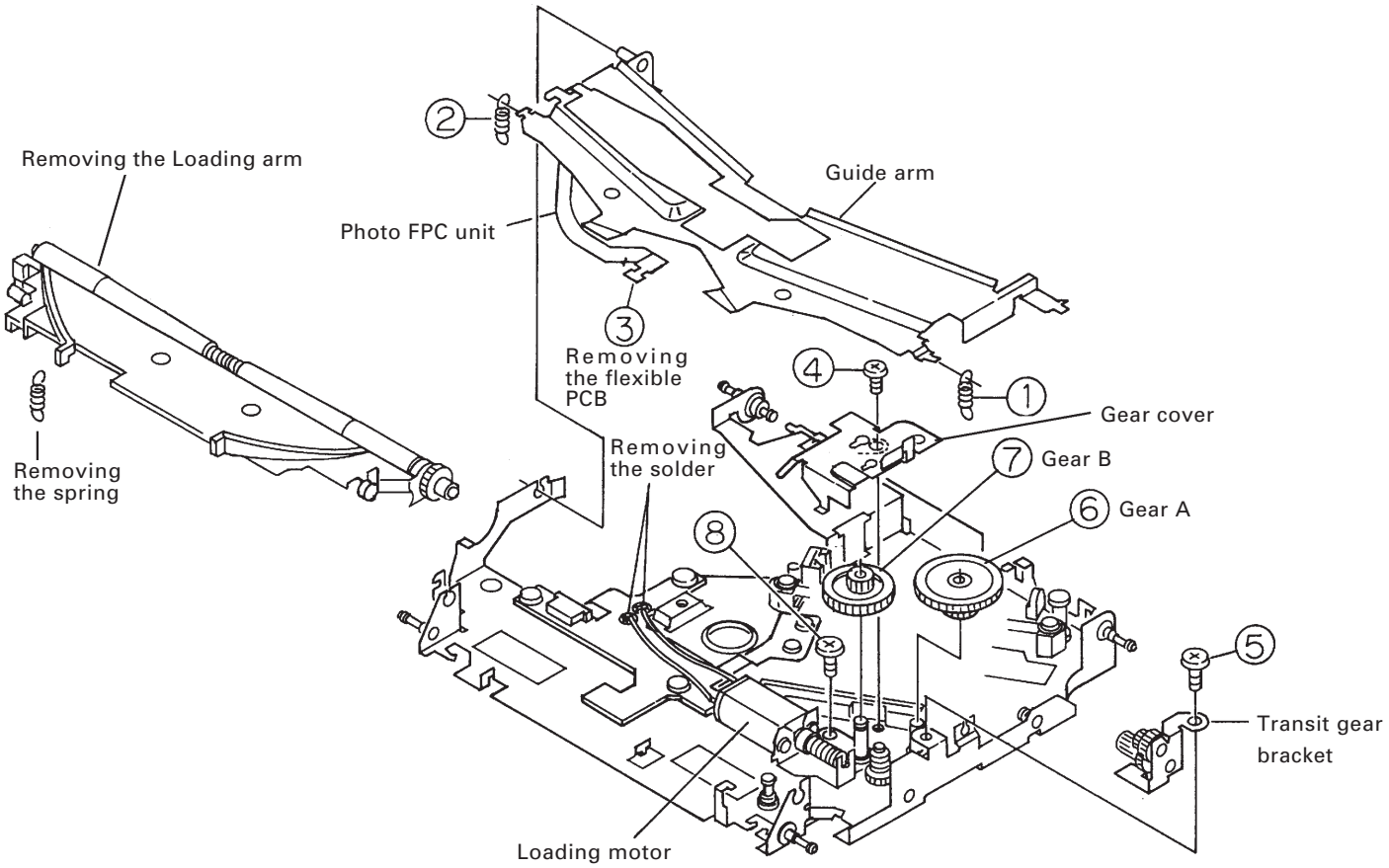
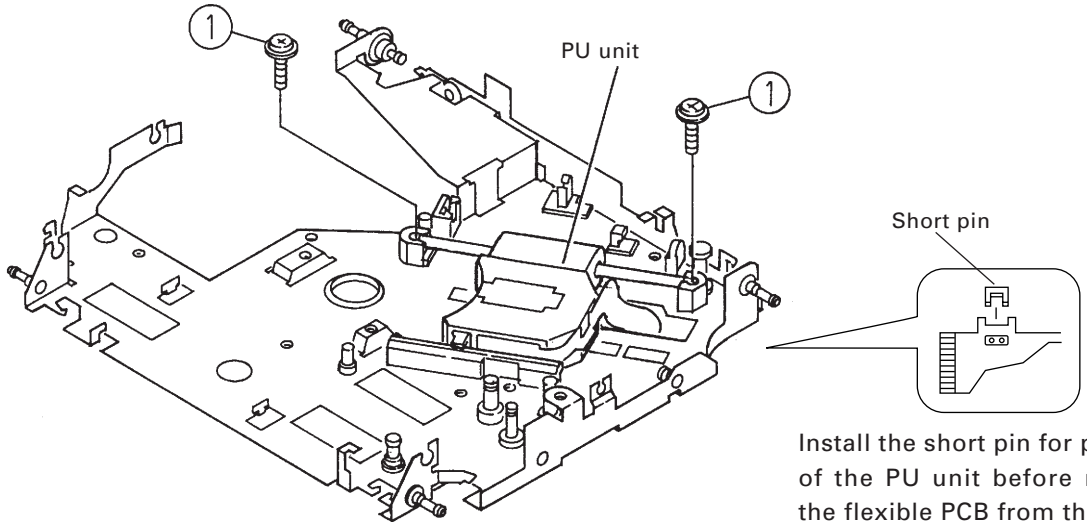


Fig. 26

● Removing the PU unit

When tighten screw (1), tighten with a torque of 1.8 kg-cm.



Install the short pin for protection of the PU unit before removing the flexible PCB from the connector (CN101).

Fig. 27

● How to hold the CD mechanism module

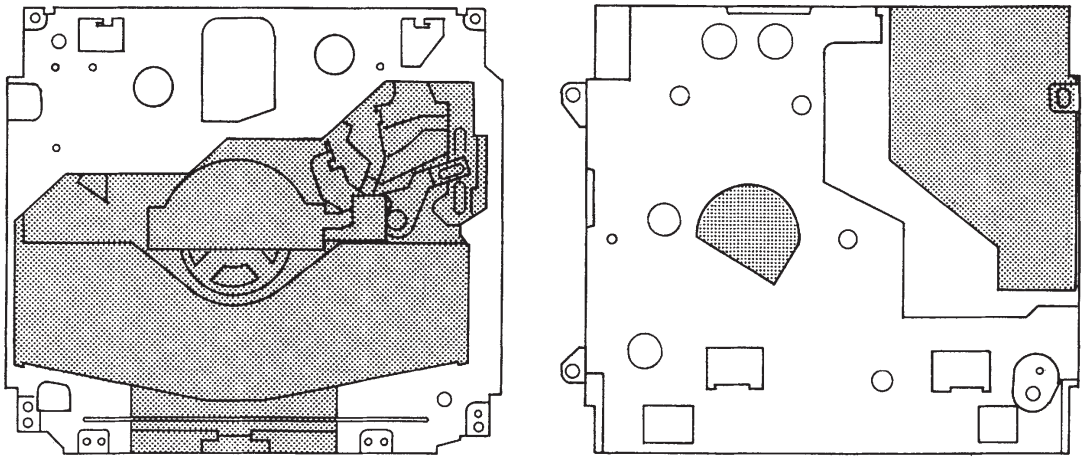
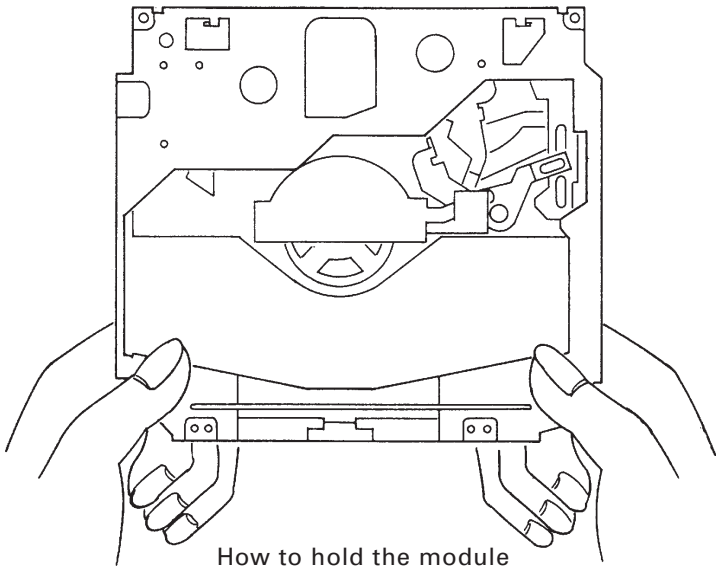


Fig. 28

Do NOT hold the parts indicated in dark color.



How to hold the module

Fig. 29